International Labour Conference
88th Session 2000

Report VI (1)

Safety and health in agriculture

International Labour Office Geneva

International Labour Conference
88th Session 2000

Report VI (1)

Safety and health in agriculture

Sixth item on the agenda

International Labour Office Geneva

ISBN 92-2-111517-8
ISSN 0074-6681

First published 1999

The designations employed in ILO publications, which are in conformity with United Nations practice, and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the International Labour Office concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.
Reference to names of firms and commercial products and processes does not imply their endorsement by the International Labour Office, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

ILO publications can be obtained through major booksellers or ILO local offices in many countries, or direct from ILO Publications, International Labour Office, CH-1211 Geneva 22, Switzerland. A catalogue or list of new publications will be sent free of charge from the above address.

Printed in Switzerland ATA

CONTENTS

	Page
INTRODUCTION	1
CHAPTER I: *General overview*	3
Globalization trends and technological development	5
Composition of the agricultural working population	8
CHAPTER II: *Legislative provisions on safety and health in agriculture*	15
Definitions of agriculture under national laws	15
Definitions related to agriculture found in relevant ILO instruments and technical documents	16
Coverage of the agricultural sector in national legislation	17
National safety and health laws that exclude agriculture	18
National safety and health laws that exclude certain categories of agricultural workers	18
Child labour and legislation	20
Women workers in agriculture	21
National safety and health laws that do not exclude agriculture	21
Regional standards	23
National safety and health laws that comprehensively address agriculture	23
Subordinate safety and health standards relevant to agriculture	24
Decrees and regulations concerning agricultural machinery	25
Decrees and regulations concerning hazardous substances	26
Housing and other facilities	27
Provisions on training and information concerning safety and health	28
Other legislation relevant to agriculture	28
Limitations inherent in the scope of the laws	29
CHAPTER III: *Administration and enforcement of national legislation*	35
Competent authorities and inter-institutional coordination	35
Limitations due to lack of enforcement	38
Notification of occupational injuries and diseases	39
Under-reporting	40
Compensation schemes for occupational injuries and diseases in agriculture	42
Workers' and employers' participation in health and safety through collective agreements	43

CHAPTER IV: *Safety and health practice in agriculture* 49
Working practices and working conditions 49
Ergonomics and technology transfer 51
Occupational accidents in agriculture 52
Accidents with tractors and agricultural machinery 54
Accidents in silos and other deposits 55
Occupational and work-related diseases 55
The use of chemicals in agriculture 57
Zoonoses 62
Other infectious and parasitic diseases 62
Dermatological diseases 63
Respiratory diseases 64
Climatic conditions 65
Occupational cancer 65
Lifting and carrying of loads and musculoskeletal disorders 66
Noise and vibration 67
Relation between general diseases and work-related diseases 67
Health care services in the rural sector 69
Training and information in health and safety at work in agriculture 71
Repercussions of agricultural production processes on the environment 73
CHAPTER V: *ILO action on safety and health in agriculture* 77
ILO instruments, guides and codes of practice 77
Meetings 77
Technical cooperation 77
Cooperation with other international organizations 79
Towards the adoption of new standards 79

Questionnaire 81

ANNEX I: *ILO Conventions and Recommendations of direct relevance to safety and health in agriculture adopted since 1919* 91

ANNEX II: *Other existing ILO Conventions and Recommendations relevant to agriculture adopted since 1919* 95

INTRODUCTION

This law and practice report has been prepared by the Office, following the decision of the Governing Body at its 271st Session[1] (March 1998) to place an item on safety and health in agriculture on the agenda of the International Labour Conference at its 88th Session in 2000.

The report examines existing legislation and practice on safety and health in agriculture in ILO member States. The term "legislation" is used in the broad sense to include statutes, regulations, codes of practice and other similar instruments of a legislative character. Both general labour codes and specific laws that address safety and health are examined. An attempt is made to analyse the application of legislation wherever possible, based on available information. The content of the report is based on information provided by member States through a survey, the ILO's legislative database (ILOLEX), the ILO's safety and health database (CISDOC) and other sources available at the International Labour Office in Geneva.

In view of the limited time-frame for the preparation of this report and the fact that a number of the replies to the survey from member States were late, the report was completed before some replies had been received. The report does not set out to review the relevant legislation in each member State of the ILO but rather to provide examples of national laws worldwide, in order to give the reader a representative sample of the pertinent issues in current law and practice in safety and health in agriculture. Any further information from member States that would help the Office to give a more comprehensive overview of national legislation would be most welcome.

A questionnaire based on the above-mentioned assessment is enclosed with the report. The purpose is to request member States to provide the Office with their views concerning the scope and content of the proposed instrument, after consultation with the most representative organizations of employers and workers.

Due to the broad scope of the agricultural sector, it would be advisable to consult other relevant ministries and institutions dealing with agriculture, such as Ministries of Agriculture, Health and Environment, for the preparation of the replies.

Note

[1] Document GB.271/4/1, para. 274.

CHAPTER I

GENERAL OVERVIEW

Half of the world labour force is employed in agriculture and an estimated 1.3 billion workers are engaged in agricultural production worldwide. The share of the agricultural labour force in the total economically active population is under 10 per cent in developed countries and accounts for 59 per cent of workers in the less developed regions.[1]

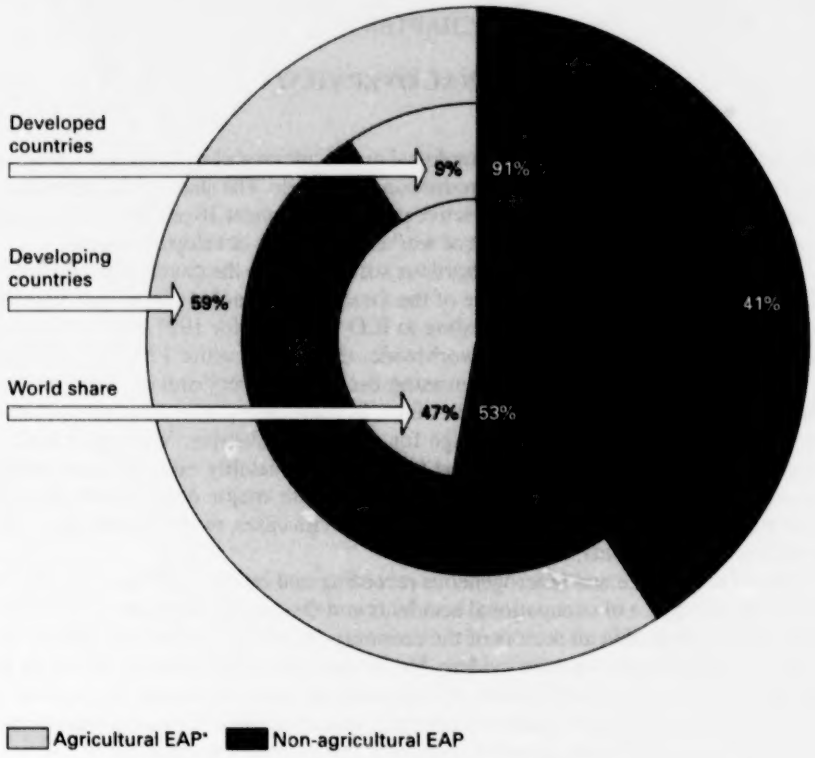
Agriculture is one of the most hazardous sectors in both the developing and industrialized countries. It is ranked as one of the three most hazardous industries together with mining and construction. According to ILO estimates for 1997, out of a total of 330,000 fatal workplace accidents worldwide, there were some 170,000 casualties among agricultural workers.[2] The increasing use of machinery and of pesticides and other agrochemicals has aggravated the risks. In several countries, the fatal accident rate in agriculture is double the average for all other industries. Machinery such as tractors and harvesters cause the highest frequency and fatality rates of injury. Exposure to pesticides and other agrochemicals constitute major occupational hazards which may result in poisoning and death and, in certain cases, work-related cancer and reproductive impairments.

Due to inadequate and heterogeneous recording and notification systems, official data on the incidence of occupational accidents and diseases are imprecise and notoriously underestimated in all sectors of the economy. In the case of the agricultural sector under-reporting is even more evident. Under-reporting is partially explained by the difficulties involved in the diagnosis of occupational and work-related diseases and in establishing the employment status of agricultural workers (self-employed, piece-rate, full-time or part-time work, seasonal, temporary and migrant workers, etc.).

Compared to workers in other sectors, agricultural workers are under-protected. They suffer markedly higher rates of accidents and fatal injuries than other workers, with very few resources available for compensation. In many countries, agricultural workers are excluded from any employment injury benefit or insurance scheme. Self-employed farmers are rarely covered by any recording and notification system and only have access to social security benefits if they contribute individually to voluntary insurance schemes. The most vulnerable groups are workers in family subsistence agriculture, daily labourers in plantations, seasonal and migrant workers, women workers and child labourers. Temporary workers are especially vulnerable. They are more exposed to occupational hazards than other agricultural workers, and are lower paid. In addition, migrant workers may encounter language and cultural difficulties at work and in their daily lives.

One of the difficulties in dealing with agriculture is that it is a very complex and heterogeneous sector. It involves a number of specific situations which vary from country to country and between developed and developing countries — from highly mechanized agriculture in plantations to traditional methods in small-scale subsistence agriculture. "Agriculture" covers not only farming but also many other associated activities such as crop processing and packaging, irrigation, pest management, grain

Figure 1.1. Distribution of agricultural and non-agricultural labour force in 1996



* Economically active population

Source: ILO, Geneva, 1998.

storage, animal husbandry, construction and domestic tasks (carrying water or fuel-wood, etc.). Agricultural work — and this is one of its distinguishing characteristics — is carried out in a rural environment where there is no clear-cut distinction between working and living conditions. As agricultural work is carried out in the countryside, it is subject to the health hazards of a rural environment as well as those inherent in the specific work processes involved. Most agricultural work is carried out in the open air and consequently agricultural workers are dependent on weather changes to perform their tasks. This factor not only undermines the efficiency of the operations, but also influences working conditions, making them difficult and dangerous (e.g. a rainstorm while harvesting, gusts of wind when pesticides are being applied, etc.).

In developing countries, a large number of rural people live below the poverty line.[3] Socio-economic, cultural and environmental factors also influence the working

and living conditions of farmers and agricultural workers. The environment in which rural people work and live, their standard of living and their nutrition are as important to their health as the services available to them. Most agricultural workers in developing countries have poor housing conditions and an inadequate diet, and are exposed to both general and occupational diseases. They may live in extremely primitive conditions, usually dispersed in remote areas where roads are non-existent or inadequate and transportation is difficult. Agricultural workers are dependent on the general standards of public health services in rural areas where the provision of health care, adequate water supply and sanitation systems are generally insufficient. The low standards of hygiene in living quarters affect not only smallholdings, but also the large enterprises which provide housing for temporary workers and for migrant workers.[4] Rural communities often lack education and information on the health hazards they may face. Traditional health approaches have few effective mechanisms to reach rural communities. There are also environmental implications arising from the degradation of natural resources and local and global environmental changes. Environmental pollution causes occupational and general health risks to workers, their families and the communities, as it also has an adverse effect on the ecosystem. Hence the problems faced by agricultural workers are interwoven and complex.

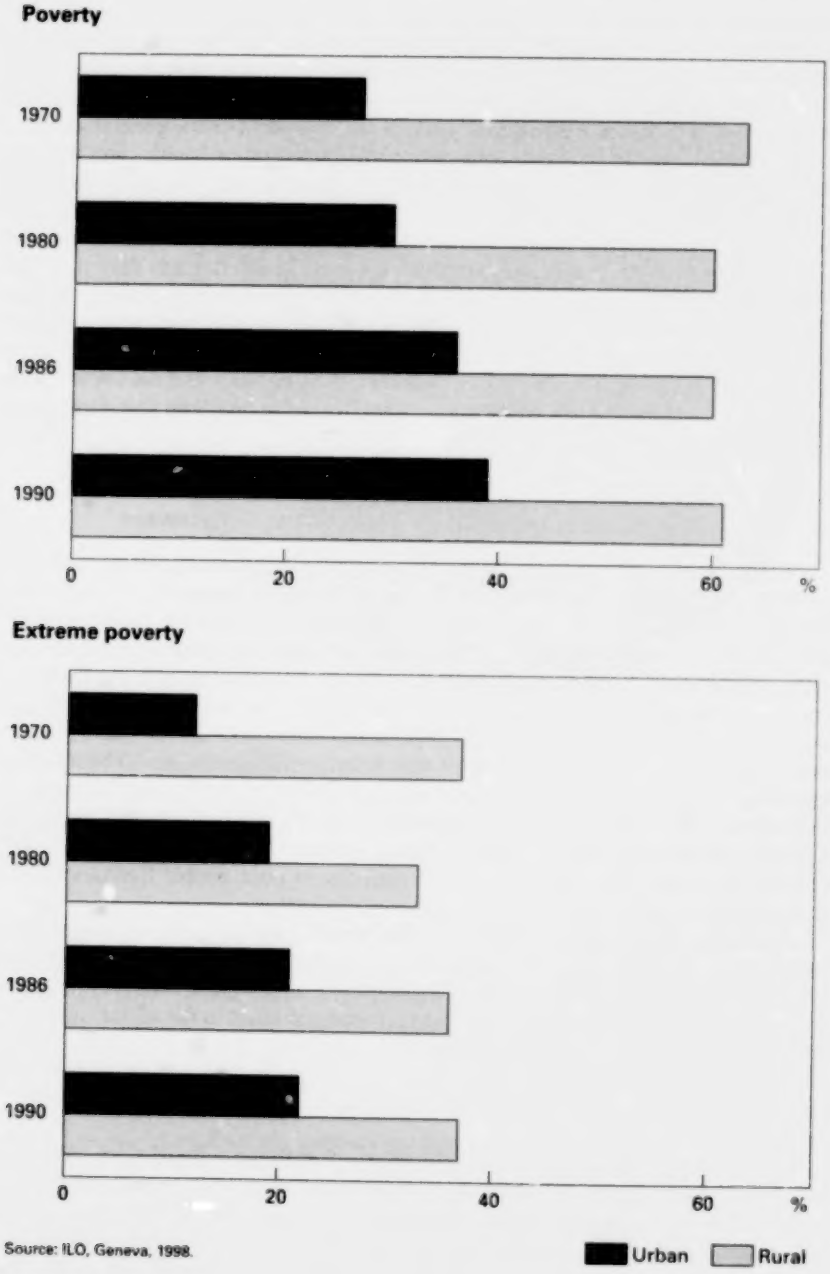
Globalization trends and technological development

Generally speaking, the introduction of machinery and chemicals in agriculture has made a significant contribution to the increase of food production worldwide — although even that has not been enough to come to grips with the famine affecting many countries. At the beginning of the 1990s, the world agricultural production per capita stagnated, with an ensuing increase in the world's food deficit; the number of countries suffering from a food deficit rose from 15 in 1994 to 29 in 1997,[5] with more than half of them in Africa. The rural populations who make up the majority of the world's poor, were the main victims of this deteriorating situation.[6, 7] The Food and Agriculture Organization of the United Nations (FAO)[8] and the United Nations Commission[9] for Latin America and the Caribbean (ECLAC) have shown that the number of people living in poverty in Latin America and the Caribbean rose by 60 million between 1980 and 1990. And even if the majority of poor people live in cities, the incidence and severity of poverty are greater in rural areas.

Moreover, technological change in agriculture has not been accompanied by investment in the protection and improvement of workers' safety and health. Though technological change has brought about a reduction in the physical drudgery of agricultural work, it has also introduced new risks hitherto unknown to the sector, such as: an increasing number of oocupational accidents and serious injuries; a rise in the incidence of deaths at work due to agricultural machinery and the destabilization of the ecosystems of large areas of the world on account of a non-sustainable approach to agricultural development.

Inequalities in the economic development of different countries, or of regions within the same country, have resulted in the coexistence of a number of forms of production in agriculture. In broad terms, they may be grouped in "two main agricultural sectors". The first of these sectors is characterized by low-skilled subsistence farming, in which a large proportion of the rural population works; the other often uses

Figure 1.2. World poverty in urban and rural populations



Source: ILO, Geneva, 1998.

highly automated production processes and, consequently, achieves high productivity with relatively few workers. There are significant skill differences existing between the two sectors; the first involves those engaged in subsistence farming,[10] whilst the second includes skilled market-oriented farmers and agricultural workers.

Technological development has also led to a decline in the share of the agricultural labour force in the total economically active population worldwide. In industrialized countries intensive mechanization has hastened the decline in the number of permanent workers in agriculture (less than 10 per cent). In developing countries the proportion of agricultural workers is still high (more than 50 per cent of the economically active population). Even though the share of agriculture in the labour force is gradually declining, the number of agricultural workers in absolute terms continues to rise, as does the area under agricultural production.[11]

Table 1.1. Distribution of the economically active population (EAP) in agriculture in the world in 1996

Region	Total population	Rural population		Agricultural EAP	
	1,000	1,000	% of total pop.	1,000	% of total pop.
Near East and North Africa	365	158	43.3	48	13.2
Sub-Saharan Africa	547	386	67.3	167	30.5
Asia and Pacific	3 010	2 093	69.5	977	32.5
Latin America	477	123	25.7	43	9.0
Transition countries	415	141	34.0	37	8.9
Developed countries	1 289	349	27.1	56	4.3

Data source: FAO: *The state of food and agriculture. The agroprocessing industry and economic development* (Rome, 1997).

Table 1.2. Agricultural population in selected countries in 1996

Degree of labour use in agriculture	Country	Total population (millions)	Agricultural population as percentage of total
High	Kenya	28	79
	Mexico	93	79
	Zimbabwe	11	73
	China	1 232	71
Medium	Algeria	29	24
	Brazil	161	18
	South Africa	42	12
	Bulgaria	8	11
Low	Australia	18	4
	United States	269	3
	France	58	3
	Canada	30	2

Data source: FAO: As for table 1.1

Composition of the agricultural working population

One of the specific characteristics of the agricultural sector is the lack of clear-cut distinctions between different categories of workers and the size and types of landholdings. Indeed, there is a wide range of landownership patterns and methods of cultivation. Consequently, there are numerous types of labour relations and different forms of labour force participation — and the situation varies between the industrialized and developing countries. The different categories of workers also vary within each country and, in certain cases, a single farmer may be grouped in more than one category. For example, in developing countries, many smallholders supplement their subsistence farming income with wages earned by working on large commercial farms during harvesting periods.

In broad terms, the following categories may be identified:

— *large landowners* running enterprises specialized in agricultural production; they use advanced technologies and enjoy benefits such as bank credits, crop insurances, technical assistance, etc.;

— *medium-sized and small landowners* operating farms with varying technical and financial means which produce for the domestic and/or the export market; certain *small landowners* in developing countries combine small-scale agriculture and cattle-raising;[12]

— *unpaid family workers* who share the income from production;

— *subsistence farmers*, mainly found in developing countries, who own microholdings, lack technical know-how and supplies and work as temporary wage-labourers to supplement the insufficient earnings from their own production;

— *sharecroppers and tenants* who cultivate communally owned, state-owned or private properties, the former paying a share of the production as rent in kind or in money, the latter renting the land for a fixed annual rent;

— *cooperative workers* who participate in collective economic enterprises for agricultural production;

— *permanent agricultural workers*, not owning land, who are usually employed for wages on medium-sized and large enterprises;

— *specialized workers* employed for specific tasks on farms, (tractor drivers, applicators of pesticides, etc.);

— *landless temporary and daily labourers* who do not own land and move between agriculture and other complementary rural economic activities according to the availability of work, in very precarious conditions;

— *squatters*, who occupy uncultivated land in state- and privately-owned *latifundia*,[13] living more often than not in shacks and liable to expulsion;[14]

— *migrant workers*, temporarily engaged during harvesting periods, who come from other regions in the country or neighbouring countries; these workers are poorly housed, underpaid and have no access to health services;

— *indigenous peoples* owning a collective property of land who are mainly engaged in subsistence agriculture; in some cases they also work on a temporary basis in agricultural enterprises.

In industrialized countries, most agricultural workers are small-scale landowners who operate farms with varying technical and financial means and produce for the domestic and/or the export market. In Europe small and medium-sized landholdings are usually family farms, with a high level of productivity. They tend to employ seasonal workers at times of high demand for labour, particularly when they specialize in

vegetable, fruit and grape production, where mechanization is not highly developed. Table 1.3 shows the distribution and size of holdings in France, which is one of the European countries with a high level of agricultural production.

Table 1.3. Number and surface area of agricultural production units in France in 1993

Area	Number of units	% of total units
< 5 ha	224 000	28
5 to 20 ha	184 000	23
20 to 50 ha	208 000	26
50 to 100 ha	128 000	16
> to 100 ha	56 000	7

Source: Mutualité Sociale Agricole (MSA), 1994 statistics.

As in Europe, most agricultural workers in Asia and Africa are small-scale farmers; however, their working and living conditions differ substantially from those in the industrialized world. Certain small landowners in developing countries combine small-scale agriculture and cattle-raising; the farming sector in southern Africa is composed of smallholders, generally under communal tenure, who work with family members and non-wage labour.[15] In Malaysia, there are up to 1 million smallholders — of which half are involved in holdings of less than 40.5 hectares.[16]

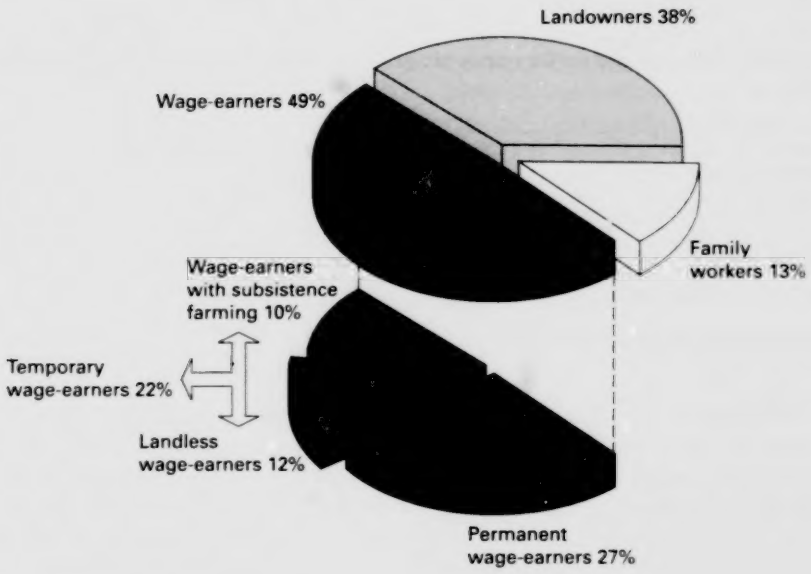
Table 1.4. Number and area of small-scale holdings

Country	Period	Maximum size of smallholdings	Number (as % of total)	Area (as % of total)
Bangladesh	1983-84	< 1 ha	70.3	29.0
Brazil	1985	<10 ha	52.9	2.7
India	1985-86	< 1 ha	58.0	13.2
Morocco	1973-74	< 5 ha	79.8	24.6
Pakistan	1990	< 1 ha	27.0	4.0
Philippines	1990	< 2 ha	50.9	—
Turkey	1987	<10 ha	18.2	—
Zimbabwe	1983	—	70.3	29.0

Source: ILO: *Wage workers in agriculture: Conditions of employment and work*, Sectoral Activities Programme (Geneva, 1996).

In Latin America the distribution is somewhat different: wage-earners constitute a large proportion of the economically active population. For example, in Central America they represent 49 per cent of the agricultural labour force; of these 27 per cent are permanent employees, 10 per cent are part owners and part temporary workers, and 12 per cent are temporary landless workers. In Brazil there are 12 million landless peasants out of a rural population of 23 million.[17]

Figure 1.3. Distribution of agricultural workers by category in Central America



Data source: ILO: Project RLA/93/MO3/DAN-Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama (unpublished document, Geneva, 1998).

There are a number of features which characterize small-scale holdings in developing countries. First, the whole family — from the very young to the elderly — is involved in agricultural activities; second, the workers are often very poor, illiterate or poorly educated; third, they are poorly fed and suffer from chronic ill health due to common communicable diseases; and, finally, they lack access to social and health care services and appropriate sanitary facilities.

The worldwide trend towards work flexibility and the pressure to reduce labour and production costs, is leading to an increase in daily and seasonal contracts,[18] often associated with the employment of migrant labourers who move between non-agricultural rural employment and agriculture itself. This decline in the share of permanent labour has been documented in many countries and regions. These include: Bangladesh, France, Spain, and Central and southern Africa. Most agricultural wage labour is carried out by day-labourers, seasonal labourers and temporary workers who perform the lowest-skilled tasks in poor working conditions. Working conditions and labour relations differ very much for permanent and non-permanent workers. Permanent workers not only receive some job security but also relatively higher wages and better housing, health and work benefits.

Table 1.5. Share of wage-earning and temporary workers in the agricultural labour force in selected countries (late 1980s — early 1990s)

Country	Wage-earners as per cent of total rural labour force	Temporary workers as per cent of agricultural wage-earners
India	37.1	82.0
Brazil	37.9	77.4
Chile	60.0	60.0
Guatemala	58.9	34.8
Honduras	77.7	21.0
Mexico	75.5	33.9
Panama	54.8	25.7
Spain	36.6	62.7

Source: ILO: *Wage workers in agriculture: conditions of employment and work*, Sectoral Activities Programme (Geneva, 1996).

Labour migration is one of the major consequences of growing work flexibility, casual employment, low pay, bad working conditions and poverty. It is both international and national. Wherever they come from, migrants are always heavily disadvantaged in terms of pay, social protection, housing and medical protection. This labour mobility is very significant throughout the world.[19]

The most serious problem, however, remains that of contract labour which again mainly affects migrant workers. Employers, who need to be able to count upon a supply of labour in periods of peak demand, increasingly call upon the services of labour contractors specialized in the recruitment, transport and management of agricultural workers. This process involving "middlemen" undermines the whole employment relationship, leaving "a grey area" around the employer's responsibilities and leading to a disregard for labour legislation. Conditions of employment are generally insecure and the labour contractors frequently abuse their authority over the workers by asking for commissions, over-charging for transport, housing and food, holding back wages and imposing debt slavery, etc.[20]

The migration of young men to the city means that agricultural work is increasingly left to women, the elderly and children. Women now account for 20 to 30 per cent of total agricultural wage employment, and child labour is widespread; in some countries children account for as much as 30 per cent of the agricultural workforce.

Women account for a considerable proportion of the agricultural workforce in developing countries, constituting 40 per cent of the sector's labour force in Latin America and the Caribbean.[21] In southern African countries, women are mainly occupied in non-permanent jobs in both large- and small-scale holdings — but this does not mean that they reduce their domestic activities. Women and children constitute over 40 per cent of those working in the agricultural sector in Zimbabwe — a country in which agriculture employs over half of the national labour force. Much of this labour often involves a worker's whole family (including children and the elderly)[22] and one consequence of this is that women often take their children with them into fields, thus exposing both the children and themselves to occupational hazards.[23] Most women in agriculture have practically no training or access to information on the risks involved

in their work. Exposure to poor working conditions has serious repercussions on children's growth, development and health, as well as on pregnancy, and can worsen pathologies brought on by old age.[24]

A number of studies have revealed the relationship between occupational hazards and iron deficiency and anaemia in pregnant women as well as complications in gestation, foetal disorders, physical and development disorders in new-borns and infants. The risk of miscarriages, premature deliveries and spontaneous abortions has been directly related to work in unfavourable conditions, such as microclimates in greenhouses and exposure to pesticides.[25]

According to the latest ILO estimates, at least 250 million children of between five and 14 years of age work in developing countries. In the case of almost half of these children (120 million), this work is carried out on a full-time basis. According to a survey recently carried out by the ILO in 26 countries, the participation rates of children in economic activities was much higher in rural areas than in urban centres. Seventy per cent of the surveyed children were engaged in agricultural activities, with higher ratios for girls than for boys (75 and 69 per cent, respectively). Rural children, in particular girls, tend to start working at an early age. In Latin America and the Caribbean, out of 15 million children involved in the labour market, 56 per cent work in the agricultural sector from the age of 5 to 7 years onwards. Most children work seven days a week and are paid less than the prevailing rates in their localities. They work long hours — and a very high proportion of these children are injured at work. The most common injuries include: cuts and wounds, eye infections, skin problems, fever, and headaches caused by excessive heat or by exposure to pesticides while working in agricultural fields.[26]

Notes

[1] ILO: *Yearbook of Labour Statistics, 1996* (Geneva, 1996); W. M. Coombs: "Agricultural health — Quo Vadis" in *OccHSA*, July/Aug. 1995, Vol. 1, No. 4; FAO: *The state of food and agriculture, 1996* (Rome, 1996).

[2] ILO: *Yearbook of Labour Statistics, 1996*, op. cit.; National Safety Council: *International Accident Facts* (Illinois, United States, 1995); J. L. Murray and A. D. Lopez (eds.): *The global burden of disease* (WHO Global burden of disease and injury series. World Bank, Harvard School of Public Health, Washington, DC, 1997); FAO: *The state of food and agriculture*, op. cit.

[3] *World Bank Atlas, 1997* (World Bank, Washington, DC, 1997).

[4] ILO: *Structure and functions of rural workers' organizations*, A workers' education manual, Second edition (Geneva, 1990); IMF: *World economic outlook. Globalization. Opportunities and challenges* (Washington, DC, May 1997); D. Coplan: "Damned if we know: Public policy and the future of the migrant labour system", in J. Crush, W. James and F. Vletter et al. (eds.): *Labour migrancy in Southern Africa: Prospects for post-apartheid transformation* (University of Cape Town, South Africa, 1995), Southern African Labour Monographs 3/95, Labour Law Unit; S. Gomez and E. Klein: *Los pobres del campo. El trabajador eventual, FLACSO/PREALC* (ILO, Santiago, Chile, 1993).

[5] ILO: *Wage workers in agriculture: Conditions of employment and work*, Sectoral Activities Programme (Geneva, 1996).

[6] Economic Commission for Latin America and the Caribbean (ECLAC): *Panorama social de América Latina* (United Nations, Santiago, Chile, 1993).

[7] ILO: *Structure and functions of rural workers' organizations*, op. cit.

[8] FAO: *The state of food and agriculture, 1997* (Rome, 1997).

[9] ECLAC, op. cit.

[10] ILO: *International standard classification of occupations*, ISCO-88 (Geneva, 1990).

[11] The rate of decline is slowing down: projections show 0.6 per cent per year in 1900-2000, and 0.45 in 2000-10. See ILO: *Wage workers in agriculture*, op. cit.

[12] Accounting for 85 per cent of agricultural economically active population in Uganda. See D. K. Sekimpi: "Occupational health services for agricultural workers", in J. Jeyaratnam (ed.): *Occupational health in developing countries* (Oxford University Press, United Kingdom, 1992).

[13] In Latin America, *latifundium* corresponds to a large-landed propriety of which only a small part is productive.

[14] For example, in 1996, 40,000 squatters were living in 244 temporary dwellings in uncultivated land in Brazil. See S. Salgado, Mouvement des Paysans Sans Terre (MST) and Frères des Hommes: *«Terra.» L'enjeu politique des Brésiliens* (Paris, 1997).

[15] R. Loewenson: *Occupational health and safety in agriculture in southern Africa*, report prepared for the ILO (unpublished, Harare, Zimbabwe, 1998).

[16] I. H. Singh: *Occupational health and safety in the plantation sector*, proceedings of the National Seminar on Effective Labour Inspections in the Plantation Sector, Kuala Lumpur, Malaysia, 1986.

[17] S. Salgado, op. cit.; S. Gomez and E. Klein, op. cit.; F. Bourquelot: "De quelques tendances sur l'emploi des salariés dans la production agricole", in *Economie rurale* (Paris, 1987), No. 178-179; L. Gavira Alvarez: *Segmentación del mercado de trabajo rural y desarrollo: el caso de Andalucia* (Ministerio de Agricultura, Pesca y Alimentación, Madrid, 1993); ILO: *Wage-workers in agriculture*, op. cit.; D. Copland, op. cit.

[18] S. Gomez and E. Klein, op. cit.

[19] P. Egger: *Travail et agriculture dans le tiers monde. Pour une politique active de l'emploi rural* (ILO, Geneva, 1993).

[20] ILO: *Wage workers in agriculture*, op. cit.

[21] ILO: *ILO News. Latin America and the Caribbean. 1996 Labour overview* (Geneva, 1996).

[22] Editorial comment in: *On Guard* (Harare, Zimbabwe, 1997). Vol. 6, No. 11.

[23] R. Loewenson: *Epidemiology in occupational health in developing countries* (mimeo, Zimbabwe Congress of Trade Unions, Harare, Zimbabwe, 1992).

[24] C. Tibone: "Health hazards associated with agricultural activities in Botswana and how they affect women", in *East African Newsletter on Occupational Health and Safety. Agriculture* (Helsinki, 1989), No. 3, pp. 22-23.

[25] ibid.

[26] V. Forastieri: *Children at work. Health and safety risks* (ILO, Geneva, 1997).

CHAPTER II

LEGISLATIVE PROVISIONS ON SAFETY AND HEALTH IN AGRICULTURE

DEFINITIONS OF AGRICULTURE UNDER NATIONAL LAWS

It is unusual to find a definition of "agriculture" in national labour codes and safety and health legislation.[1] This is probably because few national safety and health laws explicitly exclude agricultural undertakings from their scope. Even in cases in which national laws define "agriculture" or "agricultural work", the definitions are often general and imprecise. Some relevant definitions have been identified and a representative sample is reproduced below.

In New Zealand, section 2 of the Health and Safety in Employment Regulations (1995) includes the following definition of "agricultural work":

Agricultural work:

(a) means work on any farm, being work directly related to the operation of the farm; and

(b) includes:

  (i) horticultural work; and

  (ii) shearing work; and

(c) includes cooking for any person carrying out any agricultural work; but

(d) does not include any work on any marine or freshwater farm.

In the Labour Code of the United Arab Emirates, the following definition of "agricultural work" is included:

Agricultural work: Work involving the ploughing and cultivation of the soil, the harvesting of crops of any kind and the breeding of cattle, poultry, silkworms, bees, etc.[2]

The Malaysian child labour legislation defines an "agricultural undertaking" as:

any work in which any person is employed under a contract of service for the purposes of agriculture or horticulture, the tending of domestic animals and poultry or the collection of the produce of any plants or trees, but does not include any work performed in a forest.[3]

In Chile, the Labour Code (1994) excludes forestry workers other than those employed at temporary sawmills from its definition of "agricultural work".

In Section 1140.4 (a) of the Californian Agricultural Labor Relations Act (1975), "agriculture" includes:

farming in all its branches, and, among other things, includes the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any agricultural or horticultural commodities, . . . the raising of livestock, bees, furbearing animals, or poultry, and any practices (including any forestry or lumbering operations) performed by a farmer or on a farm as an incident to or in conjunction with such farming operations, including preparation for market and delivery to storage or to market or to carriers for transportation to market.

A relevant definition is also included in the United States Federal Migrant and Seasonal Agricultural Worker Protection Act (1983). Section 3 of the Act defines an "agricultural employer" as:

a person who owns or operates a farm, ranch, processing establishment, cannery, gin, packing shed or nursery, or who produces or conditions seed . . .

Brazilian legislation contains the following definition of "rural employer":

A physical person, whether an owner or not, of a rural enterprise or a piece of land, who carries out, with the contribution of employees in a permanent fashion, directly or through intermediaries, agricultural tasks defined as crop production, shepherding, horticulture or rural industry including the extension of primary production, both plant or animal products.[4]

When reviewing the definitions of "agriculture" in national legislations it became apparent that there was not one clear and consistent approach. This may be attributed to the fact that the various national instruments examined largely serve different policy purposes. The definitions employed must be considered within the context of their use — an aspect which is normally taken into account in the drafting of ILO instruments. On the basis of the review of the above definition in national legislations, it is possible to draw some tentative conclusions. "Agriculture" includes the cultivation and harvesting of crops, generally includes the breeding of animals and shepherding, horticultural activities, and generally excludes forestry work unless it is incidental to farming, such as isolated tree-felling.

Definitions related to agriculture found in relevant ILO instruments and technical documents[5]

In 1962, at its Fourth Session, the joint ILO/WHO Committee on Occupational Health discussed occupational health problems in agriculture and developed two relevant definitions to assist the Committee in its work; these are still valid in the context of ILO's activities. The Committee agreed that agriculture should mean:

all forms of activities connected with growing, harvesting and primary processing of all types of crops, with the breeding, raising and caring for animals, and with tending gardens and nurseries.

It also settled upon a definition of *agricultural worker*:

any person engaged either permanently or temporarily, irrespective of his legal status, in activities related to agriculture as defined above.[6]

A definition of an agricultural undertaking may be found in the Labour Inspection (Agriculture) Convention, 1969 (No. 129), and its accompanying Recommendation (No. 133). Article 1 (1) of the Convention states that the term "agricultural undertaking" means:

undertakings and parts of undertakings engaged in cultivation, animal husbandry including livestock production and care, forestry, horticulture, the primary processing of agricultural products by the operator of the holding or any other form of agricultural activity.

Articles 1 (2) and (3) authorize the competent authority to define the line which separates agriculture from industry and commerce.

The ILO Committee of Experts on the Application of Conventions and Recommendations, in its 1985 General Survey, deliberated on the meaning of the expression "agricultural undertaking" in Convention No. 129. The Committee considered that the strict meaning of the expression included only "the direct exploitation of vegetable and animal resources",[7] but that certain national laws defined the term so as to include primary processing of products by the operator.[8]

The following instruments refer to "agriculture" without defining the term: the Right of Association (Agriculture) Convention, 1921 (No. 11); the Night Work of Children and Young Persons (Agriculture) Recommendation, 1921 (No. 14), and the Rural Workers' Organisations Convention, 1975 (No. 141) and its accompanying Recommendation (No. 149).

Coverage of the agricultural sector in national legislation

The examination of national safety and health laws has revealed a wide diversity of national approaches to legislation addressing safety and health in the agricultural sector. In most cases general labour laws or labour codes may give no specific reference or may not be applicable in full to the agricultural sector. Agriculture tends to be omitted from the occupational safety and health legislation in many countries; however, in certain cases, acts contain limited reference to the sector. In other countries, general labour laws apply to agriculture along with other industries (for example, Brazil, Kenya, Mexico and Spain).

In certain countries, there are no safety and health laws applicable to the agricultural sector at all.[9] The general labour laws of a number of countries exclude agricultural workers completely or partially, such as: Cambodia, Ghana, Jordan, Morocco, Nepal, Sierra Leone, Sudan, Turkey, Yemen and Zaire .[10]

In many of the countries included in the report, there are a number of specific regulations or decrees related to agriculture which are subordinated to occupational safety and health acts or directly to labour codes. Most of these regulations concern: safety of machinery and equipment (mainly tractors and harvesters); substances or agents used in agriculture (in particular pesticides). In a number of other countries, laws specifically regulate labour relations in agriculture (for example, Argentina, Austria, Cameroon, Greece, Morocco and the United States (California)).[11] Other regulations relevant to agriculture refer to social security measures and working conditions (wages, hours of work, etc.); prohibitions on the employment of children and young workers in hazardous activities; prohibitions on the operation of certain type of machinery equipment for those under 18 years of age, etc.

Nevertheless, according to available information, comprehensive legislation on occupational safety and health in the agricultural sector is limited. Only a few countries have a full set of special provisions on safety and health in this sector, such as: Argentina, Australia, Austria, the Czech Republic, Finland, France, Hungary, New Zealand, Norway, the Netherlands, South Africa and the United Kingdom. Some of the laws are more comprehensive than others. In 1997, for example, Argentina adopted safety and health regulations for the agricultural sector. France has an extensive list of relevant regulations subordinated to its Labour Code, including a specific list of occupational

diseases in agriculture as well as regulations on occupational medical services for agricultural undertakings.

These laws will be examined in detail in the subsequent sections and may be found under the following three headings:

— national safety and health laws that indirectly or specifically exclude agriculture;
— national safety and health laws that do not exclude agriculture;
— national safety and health laws that comprehensively address agriculture.

National safety and health laws that exclude agriculture

Legislation addressing specific industrial hazards and "Factories Acts" were enacted in many industrialized countries in the late 19th and early 20th centuries. These laws invariably exclude agriculture from their scope. This type of safety and health legislation is commonly found in developing countries, particularly those which were colonized by Great Britain.[12] It often dates back to colonial times or soon after independence was granted. In general, the legislation was developed and enacted to provide protection to workers in industrial enterprises at a time when governments were striving to promote industrialization [13] and was based on relevant enactments in force in the colonizing State. There are certain developing countries in which safety and health laws are still based on Factories Acts and do not apply to agriculture as a sector. For example the Factories Act 1973 of Botswana is only applicable to "factories"— a term that is defined so as to exclude agricultural undertakings. The legislation in India, Nigeria, Sri Lanka, Swaziland, Trinidad and Tobago, and Zimbabwe, amongst others, is similarly limited in its application.[14] However, some countries such as Nepal and Pakistan have legislated not only in relation to factories but also concerning workers employed in plantations.[15]

National safety and health laws that exclude certain categories of agricultural workers

A significant aspect of the agricultural sector is the wide variety of labourers who work in it. These workers range from full-time employees working under contracts of employment through to casual, temporary and seasonal workers who are only engaged at particular times such as the harvesting season. Other people who work in agriculture include sharecroppers and tenants who generally rent land for farming, are self-employed, and are remunerated through a share of the produce. In addition, many workers are family members, including children.[16]

In addition to countries where the safety and health legislation does not apply to the agricultural sector as a whole, there are other countries where it applies only to certain categories of agricultural workers. Even though a small number of countries specifically exclude agricultural work from the coverage of their labour codes, there are many others where few if any provisions in their legislation are applicable to workers not employed under full-time contracts.

Certain countries extend the scope of the protection offered by their labour laws beyond the full-time wage employment relationship. For example, the Chilean Labour Code (1994)[17] makes specific provision for seasonal, subcontracted and temporary

workers, as well as for labour relations among tenants and sharecroppers. Mexican and Australian law contains similar provisions.

In addition to requiring employers to safeguard the safety and health of their workers, the laws of many countries require employers to safeguard the safety and health of other people who might be affected by the work of the enterprise (Fiji, Namibia, New Zealand, South Africa).[18] This very broad formulation extends the legislative protection to any person who may be working (in whatever capacity) for the employer including temporary, seasonal and contract labourers as well as family members. Third parties, including members of the public and neighbouring landowners, are also protected by such provisions which are of great importance in the agricultural sector. Indeed, they ensure that a wider range of people, including temporary workers and family members, are brought within the scope of statutory protection than is usually the case under general labour laws.

In its 1997 General Survey on Labour Administration, the ILO's Committee of Experts on the Application of Conventions and Recommendations noted the difficulties faced by labour administrations in developing countries in discharging "their important duties with regard to categories of workers such as self-employed rural workers and temporary or seasonal workers in small rural enterprises . . .". As noted earlier in this report, such workers make up a significant proportion of the agricultural workforce. The Committee noted that "sometimes it is local conditions and a lack of resources that prevent labour administration activities from being extended to such workers".[19] Although the Committee was referring to labour administration activities as a whole, similar observations may be made in relation to safety and health inspection, particularly in developing countries.

The working conditions and safety and health needs of rural workers in cooperatives, as well as of tenants, sharecroppers, migrant and temporary workers are considered in the following ILO Conventions and Recommendations: the Migration for Employment Convention (Revised), 1949 (No. 97), and its accompanying Recommendation (No. 86); the Protection of Migrant Workers (Underdeveloped Countries) Recommendation, 1955 (No. 100); the Co-operatives (Developing Countries) Recommendation, 1966 (No. 127); the Tenants and Share-croppers Recommendation, 1968 (No. 132);[20] the Human Resources Development Convention, 1975 (No. 142), and its accompanying Recommendation (No. 150); and the Rural Workers' Organisations Convention, 1975 (No. 141) and its accompanying Recommendation (No. 149).

The legal position of many of these workers under national labour codes and laws is uncertain. For example, in Ethiopia it is estimated that 80 per cent of national economic activity falls outside the protection of the Labour Code as it consists of small-scale and subsistence farming.[21] Thus, in the agricultural sector, seasonal and casual labourers are often excluded and self-employed farmers are rarely covered.

In the United States, the Occupational Health and Safety Act (1970) does not provide coverage to family members employed on a farm. Further, employers engaged in "agricultural operations" are exempt from all "General Industry Standards" except those applying to (1) temporary labour camps, (2) anhydrous ammonia, (3) pulpwood logging and (4) slow-moving vehicles.[22] In Australia (Queensland), agricultural employers are exempted from complying with significant sections of the principal safety and health requirements contained in section 146 of the Workplace Health and Safety Regulation (1997).

The safety and health legislation in Norway empowers the Crown to exempt from the scope of the Act "activities in agriculture that do not employ hired labour other than as some form of relief assistance".[23] In other countries, safety and health laws provide for the Minister or another authority to grant administrative exemptions from statutory requirements to specified employers.

In certain countries such as the Republic of Korea and Nepal, the Labour Code applies to workplaces in which there is a minimum number of workers employed.[24] Such provisions restrict the application of laws, in particular, in the agricultural sector, as a sizeable proportion of agricultural undertakings would fall below their statutory thresholds.

In other countries, agricultural workers are excluded from specific legislative protections. In Canada (Ontario) "seasonal employees in the agricultural industry" are excluded from the protection afforded by the Employment Equity Act (1993).[25]

Child labour and legislation

Children make up a significant and growing proportion of the agricultural workforce in both developing and industrialized countries.[26] In addition to general provisions requiring employers to provide a safe working environment, it is common for labour codes to regulate child labour and the work of pregnant or nursing women to protect their safety and health.

In many countries, there is a prohibition to engage children below 14 years of age. Children in age-groups ranging from 14-16 to 18 years are prohibited from performing certain hazardous work including night work, and work at heights. Of particular relevance to agriculture are provisions that prohibit young people from performing work involving exposure to chemicals such as fertilizers and pesticides, and work involving the lifting of heavy loads (for example, Costa Rica, Lithuania, Nicaragua, Sweden).[27] In the laws of many countries, there are also prohibitions on young people performing specified activities. A case in point is Paraguay, where children under the age of 18 years are prohibited from driving tractors, harvesters or other hazardous agricultural machinery.

In practice, the restrictions on child labour that are found in the laws of many countries are often limited or non-applicable to the agricultural sector. In some cases, this is due to the exclusion of agriculture from labour codes under which child labour is regulated. For example, the law in the Dominican Republic excludes agricultural undertakings from those provisions of the Labour Code that regulate child labour and working hours.[28] A recent study of child labour legislation in 157 ILO member States found that "in just over 40 countries agricultural work is permitted at any age".[29] Many countries permit "light agricultural work" or "light harvesting work" at ages as young as 12 years with the general stipulation that the work must not interfere with the child's education.[30] Nevertheless, family enterprises and subsistence agriculture are outside the scope of legislation and a large proportion of children may be found — in many cases from five years of age upwards — helping their parents or playing in the field while work is undertaken.[31]

All member States that have ratified the Minimum Age Convention, 1973 (No. 138), are required to specify a minimum age for entry to employment. The 59 member States which have ratified the Convention specify minimum ages ranging

from 14 to 16 years.[32] Articles 3 and 4 of the Convention enable member States to exclude from its application "limited categories of employment or work" other than work which "by its nature or the circumstances in which it is carried out is likely to jeopardize the health, safety or morals of young persons". Convention No. 138 is applicable to "plantations and other agricultural undertakings mainly producing for commercial purposes" but it specifically excludes "family and small-scale holdings producing for local consumption and not regularly employing hired workers".[33]

Women workers in agriculture

It is very common for labour codes and safety and health laws to make special provision for women workers, particularly when they are pregnant or nursing. In most legislation, pregnant and nursing women are protected against certain hazardous work, such as that involving the lifting of heavy loads or exposure to hazardous chemicals and ionizing radiations; China, Lithuania and Nicaragua are three examples of member States with legislative provisions of this nature.[34] Employers may be required to transfer women from work that is hazardous in this respect to other work not involving such safety and health risks. However, these provisions are of general application and do not specify agricultural work. Often the coverage is provided by separate legislation. In some countries only permanent agricultural workers are covered. Agricultural women workers are specifically covered in the following countries: Angola, Bahrain, Belize, Cambodia, Czech Republic, Egypt, Ghana, Guinea-Bissau, Islamic Republic of Iran, Italy, Lebanon, Greece, Hungary and Madagascar. In India, Nepal, Pakistan and Sri Lanka agricultural workers employed in plantations are covered. However, in many countries agricultural workers are not covered or specifically excluded from maternity protection regulations. These include Bolivia, Dominica, El Salvador, Lesotho, Peru, Philippines, Saudi Arabia, Sudan, Swaziland, Syrian Arab Republic, Turkey and Yemen.[35]

The vast majority of countries provide paid maternity leave by law and many offer health benefits and employment safeguards; however, the gap between law and practice remains wide. Those most likely to be disadvantaged include, among others, agricultural workers who are often excluded from such benefits. Nevertheless, there is a growing awareness of the impact of the working environment on reproductive health and of the negative outcomes to pregnancy associated with maternal exposure to hazardous substances, such as pesticides.

National safety and health laws that do not exclude agriculture

There is a trend away from industry-specific safety and health laws. In many industrialized and some developing countries, factories legislation has been — or is currently in the process of being — replaced by comprehensive safety and health laws that apply to all or most branches of economic activity, including agriculture. For example, in 1997, Hong Kong, China, introduced a new Occupational Safety and Health Ordinance which replaced the previous Factories and Industrial Undertakings Ordinance thus extending the number of workers protected by safety and health legislation from 800,000 to 2.6 million.[36]

The legislation in certain countries was only extended to agriculture some time after being originally introduced.[37] This broad approach to the scope afforded safety and health legislation is not confined to industrialized countries. Mauritius, Lesotho and Namibia have all passed safety and health laws that generally apply to any workplace where work is performed pursuant to a contract of employment.[38] Other examples of countries that take this approach include Australia, Bulgaria, Fiji, Hungary, Malaysia, Mexico and New Zealand.[39] Some countries such as Jamaica and Trinidad and Tobago[40] are in the process of enacting similar legislation.

A report that has been particularly influential in the United Kingdom and Commonwealth countries is the "Report of the Committee on Health and Safety at Work"; this Committee was chaired by Lord Robens and the report is better known as "the Robens Report".[41] One of the most significant recommendations of the Robens Report was that industry-specific safety and health legislation should be progressively repealed and replaced by a framework statute covering all industries. Safety and health issues arising from specific hazards or industries should be addressed in regulations and codes of practice promulgated under this framework enactment.

The ILO's Occupational Safety and Health Convention, 1981 (No. 155), as well as certain influential government reports and regional directives, have had an impact on this worldwide trend. In Europe, the so-called "Safety Framework Directive"[42] has had an influence on all Members of the European Union who are obliged to ensure that their safety and health laws conform to its requirements.[43] This Directive applies to all sectors of economic activity, including agriculture. There are also several European safety and health directives that specifically address safety and health in agriculture. These deal mainly with pesticides, machinery safety and the ergonomic design of agricultural and forestry machinery.[44]

As a result of these developments, many countries now have a principal enactment that regulates occupational safety and health in a general way across a wide range of economic sectors including agriculture. A case in point is the Republic of South Africa, which adopted legislation in 1993 that applies to all areas of economic activity with the exception of mines and certain ships.[45] Reference to this legislation may illustrate the general features of such laws. Indeed, the principal obligations under the South African Occupational Health and Safety Act 1993 arise whenever there is a person who "employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerate him" (section 1 (1)). The Act — as is commonly the case with legislation of this nature — imposes legally binding duties that are very broad and general in their scope. For example, section 8 (1) requires an employer (including an employer of agricultural workers) to "provide and maintain, as far as reasonably practicable, a working environment that is safe and without risk to the health of his workers". Similar broad duties are contained in the general safety and health laws of a number of other countries.

The enactment of such framework legislation has had important consequences for the coverage of the agricultural sector. For example, prior to 1992, New Zealand had in force legislation that specifically provided for the protection of the safety and health of agricultural workers.[46] However, this legislation was repealed by the 1992 general safety and health legislation that applies to all forms of employment in New Zealand other than residential work.[47] Specific protection of agricultural workers in New Zealand is now contained in Regulations made under this general framework Act.[48] This process appears to have resulted in more extensive protection for the agricultural

sector in this particular case. For example, while the previous Act only covered accommodation, first aid and general safety, the new regulations and the Act under which they are promulgated address these issues within the context of a wider risk-management coverage of safety and health in all industries, including agriculture. Other countries that have introduced framework safety and health laws in recent years have also repealed laws that were specific to agricultural workers (such as Australia and the United Kingdom).[49]

Regional standards

In November 1976, the Council of the European Communities adopted a resolution[50] concerning measures to simplify agricultural legislation among their members in order to implement a common agricultural policy. The Commission was requested to improve coordination between all bodies concerned for the preparation and implementation of the agricultural legislation. This initiative concerned mainly market relations and essential economic requirements for the implementation of common agricultural policy mechanisms.

Discussions on the programme of the European Commission concerning occupational safety and health, which took place from 1987 to 1992, greatly contributed to the adoption of a number of Directives specifically addressing safety and health at work. Furthermore, the European Commission included agriculture as a high-risk sector in their action programme on safety, hygiene and health in 1988. The Occupational Safety and Health Convention, 1981 (No. 155) and the Occupational Health Services Convention, 1985 (No. 161), also constituted an important precedent for the legislative reforms proposed during that period; amongst other things, they introduced the notion of a broader scope in national legislation. The Council Directive on Safety and Health at Work of 1989[51] constitutes the best example of this. It applies to all sectors of economic activity, including agriculture, without prejudice to more stringent European Union provisions to be adopted in the future.

A number of safety and health directives based on this framework Directive have since been adopted. The need for a Directive on the protection of workers in agriculture has been discussed on a number of occasions within the European Commission but the initiative has not been officially proposed to date.[52]

National safety and health laws that comprehensively address agriculture

As mentioned before, there are few countries that have safety and health laws which address agriculture in a comprehensive manner. The most relevant examples are to be found in Argentina and France.

In Argentina the Regulations on Health and Safety for Agricultural Activities came into effect on 7 July 1997.[53] These regulations address a number of aspects of the safety and health of agricultural workers including: General obligations (Title I); Infrastructure (Title II); Machinery, Tools (Title III); Pollutants (Title IV); Electricity risks (Title V); Materials handling (Title VI); Fire prevention (Title VII); Vehicles (Title VIII); Forestry (Title IX); Animals (Title X) and Training (Title XI). The regulations were developed because it was acknowledged that existing safety and health laws

in Argentina, although general in their scope, did not adequately address the specific risks of agricultural activities.[54] Argentina has also established a tripartite National Commission for Agricultural Work — which is part of the Ministry of Labour — to supervise the implementation of the law.

The French Labour Code provides the second example of a comprehensive legislative approach to safety and health in agriculture. It includes detailed provisions applicable to safety and health which have applied to agricultural undertakings since 1979.[55] The Labour Code outlines specific rules for the protection of safety and health in agricultural establishments.[56] These rules are supplemented by regulations and decrees which address certain aspects of safety and health in agriculture in greater detail.[57] The French Labour Code also makes special provision for the administration and enforcement of the safety and health requirements applicable to agricultural undertakings. Article L. 231-1-2 states that the powers conferred on the Minister of Labour and labour inspectors under the Code "shall be exercised in relation to the agricultural establishments mentioned in article L. 231-1 by the Minister responsible for agriculture and the labour inspectors working under his authority, respectively". The Minister of Agriculture is to be assisted in the development of decrees and regulations applicable to the agricultural sector by advisory bodies made up of equal numbers of representatives of employers' and workers' organizations.[58] The Code refers to occupational medicine[59] which also applies to the agricultural sector. It requires employers to "organize occupational medical services" in accordance with the relevant articles and relevant decrees.[60]

Brazilian law also includes comprehensive provisions applicable to the safety and health of agricultural workers. Act No. 5.889 of 5 June 1973 is a framework law concerned with rural workers. However, the legislative Act did not come into effect until 15 years after it was enacted under the Ordinance made under the regulations of Act No. 5.889 (1988). In the same year, rural workers were explicitly equated with urban workers under article 7 of the federal Constitution.[61] As a consequence of these reforms, a series of regulations was also promulgated under this law in 1988, addressing matters, such as accident prevention, personal protective equipment and chemicals.

Other examples include, but are not limited to: Australia, Canada, Spain, Sweden, the United Kingdom and the United States. All these countries have a significant body of decrees and regulations that apply to agricultural work which are designed to protect the safety and health of workers.

Subordinate safety and health standards relevant to agriculture

The broad duties in framework safety and health laws and labour codes are of limited effect unless they are accompanied by more specific decrees and regulations that specify exposure standards, record-keeping and reporting requirements, as well as other detailed rules. It is common for such regulations to be developed as part of a package of codes of practice, guidance notes and other similar documents. The purpose of these instruments, which may not be legally binding, is to provide employers and others with practical guidance on how they may fulfil their statutory duties of care.

The subordinate safety and health laws in many countries operate at three interrelated levels:

1. general duties of employers, workers and others in statutes;
2. more specific duties in decrees and regulations; and
3. practical advice in codes of practice, technical standards, training material and guidance material that are not legally binding.

It is at levels two and three that the national laws of certain countries address safety and health issues relevant to agriculture. However, many such laws fail to address agricultural safety and health matters comprehensively due to the lack of detailed standards. This represents a major gap in the legislative coverage of the safety and health of agricultural workers. There are indications of positive developments in this regard as a number of countries are in the process of enacting specific legislation for the sector. The ILO has been advised by Fiji that the Government expects to promulgate specific agriculture-related regulations and standards within the next two to three years. In May of 1998, Bulgaria introduced a proposed Act on Agricultural and Forestry Machinery into its National Assembly. Chile has recently enacted a code of practice on forestry work.

Safety and health provisions in general labour codes range from extensive and comprehensive provisions to those that are more specific — which mainly cover machinery safety and chemical safety. Certain countries supplement basic provisions in their labour codes by more comprehensive requirements in specific decrees or regulations (for example, Brazil, Cuba, Spain and Viet Nam).[62] There are also provisions concerning issues relevant to working conditions and specific categories of workers in agriculture, such as maternity protection, migrant workers, child labour, hours of work and accident compensation.[63] Some countries have comprehensive safety and health regulations in addition to the provisions in their labour codes that relate to occupational safety and health (Burundi, China, France and Poland).[64] Certain countries incorporate safety and health legislation into their labour codes by referring to that legislation without repeating its wording (Japan, Republic of Korea).[65]

Among the large number of subordinate decrees and regulations applicable to the agricultural sector, there are a number of them that address:

— safety measures concerning mobile machines for agriculture and forestry;
— the protection of agricultural workers exposed to pesticides;
— occupational diseases in agriculture;
— occupational medical services in agriculture;
— special protective measures for the use of explosives in agriculture;
— the prevention of accidents in agricultural silos;
— operations in agricultural enterprises requiring special medical supervision; and
— safety measures to be taken during the preparation and use of anti-parasitic products in agriculture, etc.

Decrees and regulations concerning agricultural machinery

In this section, the report examines examples of regulations and codes that are relevant to agricultural machinery and equipment.

Tractor roll-overs and exposure to dangerous parts of agricultural machinery and equipment such as augers and harvesting equipment are the cause of many injuries and fatalities among agricultural workers and members of their families.[66]

In a number of countries, decrees and regulations have been made pursuant to general safety and health laws requiring manufacturers and employers to ensure the

safety of those workers who use certain equipment and machinery (Hungary, Namibia, Norway).[67] Legislation of this nature usually requires a manufacturer to ensure that the equipment it manufactures is safe for consumers and stipulates that employers must provide and maintain safe machinery and equipment for their workers. These requirements are consistent with the Occupational Safety and Health Convention, 1981 (No. 155).

It is common for certain agricultural machinery such as tractors to be singled out under safety and health legislation with requirements for special safeguards such as roll-over protection structures (ROPS). Countries such as Finland, France, Norway, Sweden, and the United States have had such laws in place for more than a decade. Spain has enacted detailed laws regulating tractors and other agricultural machinery in recent years. Under typical laws requiring ROPS, obligations are placed on manufacturers and suppliers of identified tractors to fit them with ROPS prior to distribution and sale. There are also duties imposed on employers to ensure that tractors are fitted with ROPS.[68] As mentioned before, the Council of the European Communities has also adopted a number of Directives on agricultural machinery including a Directive on ROPS in 1987.[69]

The Guarding of Machinery Convention, 1963 (No. 119), and its accompanying Recommendation (No. 118) apply to "mobile agricultural machinery".[70] While the Convention as a whole is thus applicable to machinery used in agriculture, article 1 (3) (b) states that the provisions of the Convention apply to "mobile agricultural machinery only in relation to the safety of workers employed in connection with such machinery". The Convention came into force on 21 April 1965 and had been ratified by 49 member States as at 17 June 1998.

In its 1987 General Survey on safety in the working environment, the Committee of Experts on the Application of Conventions and Recommendations[71] noted that a number of countries (Cyprus, Sierra Leone and Zaire[72]) were in the process of extending their machinery guarding laws so as to regulate agricultural machinery as well as machinery in factories as required by the Convention.

The Committee of Experts has also frequently commented in its reports on the failure by countries, including those which have ratified Convention No. 119, to implement the Convention fully in relation to agricultural machinery. For example, in its 1989 Report on the Application of Conventions and Recommendations, the Committee noted that legislation in Zaire did not extend to agricultural machinery. Similar observations were made by the Committee in relation to Turkey in 1990, Morocco in 1995 and again in 1998 and Ghana in 1996 and again in 1998.

In its report to the Committee of Experts, France identified the inclusion of mobile agricultural machinery in Convention No. 119 as a reason for not ratifying the instrument.[73] However, in 1987, only one country had limited the Convention upon ratification as permitted under Article 17 (2).[74]

Decrees and regulations concerning hazardous substances

The safety and health laws of many countries impose an obligation on manufacturers and suppliers of hazardous substances — as well as on employers which use them — to protect workers from the dangers associated with these substances. Legislation of this nature usually requires that manufacturers and suppliers provide the recipients of

substances with hazard information such as chemical safety data sheets. Employers are in turn instructed to observe certain safeguards including the provision of information to workers about the substances they use at work.

The most commonly used substances in agriculture are fertilizers and pesticides. The use of pesticides and other agrochemicals is the subject of detailed regulation in many countries.[75] In countries such as India, Pakistan and Sri Lanka such laws, along with legislation concerning "plantations", are the main safety and health laws applicable to agriculture.

As a general rule, such laws:

— place a total ban on the use of certain pesticides or require a licence to be issued by the competent authority (in some cases, a list of banned substances is included in the legislation);
— stipulate storage conditions, container standards and work methods to be followed for mixing and applying pesticides;
— regulate working hours for workers mixing and spraying pesticides;
— stipulate personal protective equipment that must be worn by such workers;
— identify warning signs that must be posted when pesticides are being sprayed on crops;
— outline the health examinations that must be conducted on workers using pesticides and specify the reports of those examinations that must be retained and filed with the competent authority; and
— regulate the disposal of residues and wastes.

The Chemicals Convention, 1990 (No. 170), and its accompanying Recommendation No. 177 came into force on 4 November 1993; the Convention had received seven ratifications as at 17 June 1998. According to the Preamble, the purpose of the Convention is to "prevent or reduce the incidence of chemically induced illnesses and injuries at work". It applies to "all branches of economic activity in which chemicals are used" (Article 1). As chemicals are extensively used in agriculture, the Convention is clearly of great significance to the agricultural sector.

The Migrant Workers Recommendation, 1975 (No. 151), recognizes the difficulties faced by migrant workers in this regard. Article 22 (1) recommends that employers "should take all possible measures so that migrant workers may fully understand instructions, warnings, symbols and other signs relating to safety and health hazards at work". Article 22 (3) discusses a suggested approach to these matters by member States.

In its 1980 General Survey on migrant workers, the Committee of Experts on the Application of Conventions and Recommendations concluded that the special problems faced by migrant workers in relation to safety and health made it "essential not only to ensure adequate training in safety and health but also to make employers aware of the need to ensure that migrant workers fully understand all safety and health instructions and precautions, and of the fact that it may be necessary for [employers] to take special measures for this purpose, since the instructions and training given to other workers may be inadequate for migrant workers".[76]

Housing and other facilities

In a number of countries, legislation requires agricultural employers to provide basic amenities, such as housing, sanitation facilities, drinking water, transport in the

event of injury and first-aid facilities to workers; these amenities are occasionally extended to members of workers' families. The legislative provisions range from those which are highly detailed, addressing such matters as dietary requirements (for example, Chile and Uruguay), to very general provisions requiring "suitable and sufficient" accommodation (New Zealand).[77]

Provisions on training and information concerning safety and health

The safety and health laws of many countries also recognize the importance of training and information; indeed, they make it a duty for employers, including employers in agriculture, to provide this training and information to their workers (Ethiopia, Norway).[78] Similar provisions are contained in the laws of countries that specifically address safety and health in agriculture (Argentina, France).[79]

The predominance of illiterate and migrant workers in agriculture performing seasonal work during harvest periods means that many workers face reading, language and cultural difficulties when carrying out their tasks, thus undermining their safety.

In certain national laws, there is explicit recognition of the importance of providing information in languages that are understandable to the workers. For example, the Hungarian law states:

> Whenever there is an employee in a workplace who does not know Hungarian, the employer shall also make available the operational documentation, warning signs, and prohibition and information signs in a language understood by the employee.[80]

The safety and health laws in Australia (Victoria) and Fiji contain a similar requirement that specifies the importance of information being provided in a language that may be understood by the workers.[81] A code of practice has also been prepared by the Victorian competent authority to help employers meet their obligations in relation to workers whose first language is not English.[82] Illiteracy is widespread among agricultural workers in developing countries — and some countries take this into account in their provisions. For example, in Argentina, an agricultural employer must take into account "the education attained by a worker" in determining which training to provide.[83]

It is universally recognized that workers require safety-related training and information to enable them to perform their work in a manner that is safe to themselves and others. Article 19 (d) of Convention No. 155 states that arrangements at the level of the undertaking shall ensure that "workers and their representatives in the undertaking are given appropriate training in occupational safety and health"; and Paragraph 12 (2) (a) of Recommendation No. 164 adds that this training should be supplemented by "adequate information on safety and health matters".

Other legislation relevant to agriculture

In addition to the general safety and health acts and regulations addressing specific safety and health issues in the agricultural sector, there are laws which "stand alone" in the sense that they are not subordinate to framework safety and health laws. One of the significant consequences of this distinction is that the "stand alone" laws are often administered by an agency or institution different from the agency administering the

framework safety and health laws or labour codes. For example, pesticides laws are generally administered by the ministries of agriculture, environment or health. This has consequences for the coordination of the administration and enforcement of safety and health laws applying to the agricultural sector.

While there are notable exceptions, which have already been mentioned, the lack of a policy and a comprehensive approach to the enactment of legislation for the sector has resulted in the enforcement of specific regulations by different ministries — often without coordination. This may significantly compromise the application of the principal legislation to the agricultural sector. A case in point is Honduras. With a view to promoting technological development in agriculture and avoiding some of the bureaucratic obstacles for modernization, the legislation of Honduras enables agricultural producers to import "raw materials, tools or agricultural machinery" without obtaining the authorization or administrative permits that would otherwise be needed.[84] In addition, technical advice on safety measures and guidance on the selection of chemicals and agricultural equipment is not provided to such producers.

Limitations inherent in the scope of the laws

There are three limitations inherent in the scope of the general safety and health laws discussed above in relation to their application to the agricultural sector. First, as noted, the broad regulatory frameworks established by this type of legislation are, to a great extent, only effective inasmuch as they pave the way for detailed standards in the form of regulations, decrees, orders and codes of practice, etc. Only a small number of countries has developed a comprehensive set of standards applicable to agriculture. Second, in many countries, only those employed under contracts of employment are entitled to the full protection provided for under the legislation. For example, rights — such as the right to be trained, to elect a health and safety representative and to be medically examined periodically — are generally only available to "workers" under this type of legislation. As a large number of those who work in the agricultural sector are family members and other informal labourers, such as temporary and seasonal workers, the legislative protections are generally of limited interest to them or have no effect at all. Third, the legislation in many countries does not cover the self-employed as it is restricted to those employed under "contracts of service".

One important area of concern both for countries of Central and Eastern Europe and the newly independent States is the updating of occupational safety and health legislation to take account of the current economic and political situation. The need for sound environmental and safety and health practices at the workplace in order to protect agricultural workers' health was discussed recently at a meeting on environmental and occupational safety and health in agriculture held in Kiev in September 1998.[85]

Notes

[1] Where the report refers to the laws of federal States, the reader may assume that the references are to laws enacted by the national parliaments of the States concerned unless otherwise indicated. In the event that the law referred to is one made by a State or provincial parliament within a federation, the following nomenclature is employed: "Australia (Victoria)", "United States (California)", etc.

[2] Federal Law to regulate employment relationships, 1980, Part 1, section 1.

[3] Children and Young Persons (Employment) Act 1966, section 19.

[4] See Brazilian Act No. 6.260 of 6 Nov. 1975 concerning the social protection of employers and rural workers.

[5] For the list of ILO Conventions and Recommendations relevant to agriculture see Annexes I and II.

[6] ILO: *Occupational health problems in agriculture*, Report of the Fourth Session of the ILO/WHO Committee on Occupational Health (Geneva, 1963), p. 4.

[7] ILO: *Labour inspection*, General Survey by the Committee of Experts on the application of Conventions and Recommendations, Report III (Part 4B), International Labour Conference, 71st Session, Geneva, 1985, para. 53.

[8] Austria: Agricultural Labour Act (1948), section 5.

[9] In 1970, the Committee of Experts on the application of Conventions and Recommendations noted the exclusion of agriculture from the safety and health laws of many countries. See ILO: *Health, welfare and housing of workers. A survey of effect given to four ILO Recommendations* (ILO, Geneva, 1970).

[10] Cambodia: Labour Law 1992, Ch. 7 (excludes family farms); Turkey: Labour Act 1971, section 5. See also, ILO: *Safety in the Working Environment*, General Survey by the Committee of Experts on the Application of Conventions and Recommendations, Report III (Part 4B), International Labour Conference, 73rd Session, Geneva, 1987.

[11] Austria: Agricultural Labour Act 1948; Argentina: Decree No. 390, Act No. 390; Cameroon: Decree No. 68-DF-250 of 10 July 1968 to lay down the rules for the application of hours of work and provisions and exceptions thereto in agricultural and similar undertakings; Greece: Acts Nos. 1264/82, 1361, 4169 and 1915 (each of which addresses a separate aspect of the regulation of labour relations in agriculture); Morocco: Dahir made under Act No. 1-72-219 of 24 Apr. 1973; United States (California): California Labour Code, Part 3.5.

[12] For a discussion of the influence of British factories legislation on the laws in several African countries, see: *African Newsletter on Occupational Health and Safety. Legislation as a tool in occupational health and safety* (Helsinki), Vol. 2, No. 3, 1992.

[13] For example, such legislation was first introduced into the Dutch East Indies (now Indonesia) in 1910. See the Safety Ordinance, State Gazette, No. 406, 1910.

[14] See the Factories Act 1948 (India); Factories Act 1990 (Nigeria); Factories Ordinance (Sri Lanka); Factories, Machinery and Construction Works Act, 1972 (Swaziland); and the Factories Ordinance (Trinidad and Tobago) and the Factories and Works Act, Ch. 283 (Zimbabwe). Commentators have deplored the absence of comprehensive safety and health laws in India. See T. K. Joshi: "Practising occupational health in India", in J. M. Stellman (ed.): *Encyclopaedia of Occupational Health and Safety*, 4th ed., Vol 1. (ILO, Geneva, 1998).

[15] Factories Act 1934 (Pakistan) and Ordinance to provide for the welfare of labour in tea plantations, 1962, section 2, limit the operation of this Ordinance to plantations employing 30 or more workers. In Nepal, the Labour Act 1992 (which repeals and replaces earlier factories legislation) is limited in its scope to industrial enterprises and tea estates employing more than ten people.

[16] For a discussion of the safety and health risks faced by child labourers in agriculture, see V. Forastieri, op. cit.

[17] Sections 87-95. See also the Australian Workplace Relations Act 1996: sections 127A-127C which enable the industrial tribunal (the Australian Industrial Relations Commission) to review the working conditions of independent contractors in certain circumstances and section 281 of the Mexican Federal Labour Code concerning sharecroppers and tenant farmers.

[18] Fiji: Health and Safety at Work Act (1996), section 10; Namibia: Labour Act (1992), section 97; New Zealand: Health and Safety in Employment Act (1992), section 15; South Africa: Occupational Health and Safety Act (1993), section 9.

[19] ILO: *Labour Administration*, General Survey by the Committee of Experts on the Application of Conventions and Recommendations; Report III (Part 4B), International Labour Conference, 85th Session, 1997, Geneva, para. 137.

[20] Para. 18 of the Recommendation refers to the provision by landowners of adequate housing, the provision of drinking water and sanitary installations.

[21] Estimate provided in Ethiopian reply to ILO request for information.

[22] W. G. Vause: "Occupational safety and health law for agricultural employment", in *Stetson Law Review* (St. Petersburg, Florida), Vol. 8, No. 1, 1978.

[23] Act No. 4 of 4 Feb. 1977 respecting workers' protection and the working environment, Ch. 1, section 2 (5).

[24] Republic of Korea: Labour Standards Act (1997), section 10 (five or more employees); Nepal: Labour Act (1992), section 2 (b) — definition of "establishment" (ten or more employees).

[25] See Ontario Regulation 388/94.

[26] Forastieri, op. cit.

[27] Costa Rica: Labour Code, section 89; Lithuania: Law No. I-266 on labour protection, Ch. 6, subchapter 1; Nicaragua: Labour Code, sections 131 and 133; Sweden: Working Environment Act (No. 1160 of 1997), Ch. 5, section 3.

[28] Labour Code of the Dominican Republic, Title No. 6, sections 277-282.

[29] ILO: *Child labour in agriculture. A survey of national legislation* (unpublished paper) (ILO, Geneva, 1996).

[30] For example, Dominican Republic: Labour Code, section 282; Panama: Labour Code, section 119; Portugal: Legislative Decree No. 396/21 establishing new rules for the employment of minors, section 122 (2).

[31] Forastieri, op. cit.

[32] Source for number of ratifications: ILO: *Lists of ratifications by Convention and by country*, Report III (Part 2), International Labour Conference, 86th Session, Geneva, 1998.

[33] Art. 5, para. 4. As long ago as 1920, the ILO prohibited, with limited exceptions, the employment of children under the age of 14 years "in any public or private agricultural undertaking . . .": Minimum Age (Agriculture) Convention, 1920 (No. 10); note the effect of Art. 10 (3) of Convention No. 138 on Convention No. 10.

[34] China: Labour Code (1994), Ch. VII, sections 61-63; Lithuania: Act No. I-266 on labour protection, Ch. 6, subchapter 2; Nicaragua: Labour Code (1996), sections 130-137.

[35] ILO: *Maternity protection at work*, Report V (1), International Labour Conference, 87th Session, 1999 (Geneva, 1997).

[36] See: "International Conference on Occupational Health and Safety in the Informal Sector (ICOHIS'97)" in Asian-Pacific Newsletter on Occupational Health and Safety (Helsinki), Vol. 5, No. 1, 1998.

[37] For example, the original Swedish safety and health law, the 1889 Law on Dangerous Occupations only applied to industrial occupations. It was only after a committee reviewed that law in 1938 that a new law was enacted in 1949 which extended to the agricultural sector. The 1949 law was in turn repealed and replaced by the 1977 Work Environment Act which remains in force to this day. See: J. E. Korostoff, L. M. Zimmerman and C. E. Ryan: "Rethinking the OSHA approach to workplace safety: A look at worker participation in the enforcement of safety regulations in Sweden, France and Great Britain", in *Comparative Labour Law Journal* (University of Philadelphia), No. 13, 1991.

[38] Mauritius: The Occupational Health and Safety and Welfare Act No. 34, (1988); Lesotho: The Labour Code Order (1992); Namibia: The Labour Act (1992).

[39] Australia (Federal): Occupational Health and Safety (Commonwealth Employment) Act (1991); Australia (State): Workplace Health and Safety Act (1995) (Tasmania); Bulgaria: Health and Safety at Work Act (1997) (State Gazette 124 of 23 Dec. 1997); Fiji: Health and Safety at Work Act (1996); Hungary: Act No. 93 concerning Occupational Safety and Health; Malaysia: Occupational Health and Safety Act (1994) (No. 514); Mexico: Federal Act for Safety, Hygiene and the Environment (1997) (21 Jan. 1997); New Zealand: Health and Safety in Employment Act (1992).

[40] Trinidad and Tobago is at present introducing a comprehensive safety and health statute which will replace the Factories Ordinance. The new Act, to be known as the Occupational Safety and Health Act 1998, will apply to all agricultural workers.

[41] For a summary of the major findings and recommendations in the report, see: B. Creighton, P. Rozen: Occupational health and safety law in Victoria (The Federation Press, Sydney), 2nd. ed., 1997.

[42] Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, in *Official Journal of the European Communities*, Vol. 32, No. L183 (Brussels, 29 June 1989).

[43] J. Manos: "Occupational safety and health directives of the European Union: An overview" in: D. Brune et al. (eds.) *The Workplace*, Vol. 1 (Scandinavian Science Publishers, Oslo and CIS/ILO, Geneva, 1997).

[44] Manos, ibid.

[45] 1993, Occupational Health and Safety Act, Republic of South Africa, section 5 (3).

[46] See Agricultural Workers Act (1997) (New Zealand): part VI, Safety, health and welfare.

[47] See Health and Safety in Employment Act 1992 (New Zealand): section 62 (1) and schedule 3.

[48] See Part VI of the Health and Safety in Employment Regulations (1995) which deal with requirements for accommodation facilities and cooking facilities for agricultural workers.

[49] In the United Kingdom, the repeal of agricultural safety and health laws (such as the Agriculture — Safety, Health and Welfare Provisions — Act 1956) has involved a consultative process; see Health and Safety Commission: *The proposed removal of outdated agricultural health and safety legislation*, HSE Booklet CD102, HSE Books (Sudbury, United Kingdom, 1996).

[50] *Official Journal of the European Communities* (Brussels, 4 Dec. 1976), Vol. 19, No. C287.

[51] Council Directive 89/391/EEC, op. cit.

[52] L. Vogel: "L'observatoire du BTS sur l'application des directives européennes: un premier bilan", in *L'environnement du travail dans l'Union européenne: le difficile passage du droit à la pratique*, European Trade Union Technical Bureau for Health and Safety (TUTB), 1997 Conference, Brussels, 1-2 Dec. 1997.

[53] Decree No. 617/97.

[54] Argentina also has general legislation concerning safety and health: Act No. 19587 respecting occupational health and safety (1972) and Act No. 24557 respecting hazards at work (1995).

[55] Title III of Book 2 of the French Labour Code, article L.231-1 and Decree No. 79-228 of 20 Mar. 1979.

[56] Ch. II, section V, subsection 1.

[57] Decrees and regulations are made under article L.231-1.

[58] Article L.231-1-3.

[59] Title IV of Book 2, art. L.241-1.

[60] See arts. L.241-1 to L.241-5 of the Code.

[61] The expression "rural workers" is commonly used in legislation in Latin America. It is broader than the term "agricultural workers" as it includes workers such as artisans in rural areas. See, for example, the definition in section 279 of Mexico's Federal Labour Code.

[62] Cuba: Law No. 13 for Protection and Hygiene at Work (28/12/77); Viet Nam: Government Decree No. 06/CP, dated 20 Jan. 1995, giving detailed provision for a labour code on occupational safety and health. Both Brazil and Spain have an extensive list of decrees and regulations relevant to the sector.

[63] For a more detailed examination on provisions concerning labour relations, see: ILO: *Wage-workers in agriculture*, op. cit.

[64] Burundi: Labour Code 1993, section 11; China: Labour Act (1994), Ch. VI; France: Labour Code, Book II, Title III; Poland: Labour Code (1974), section 15.

[65] For example, Ch. 6 of the Labour Standards Act (1997) (Republic of Korea) mandates compliance with the Industrial Safety and Health Act. See also: Industrial safety and health law and related legislation of Japan (Japan Industrial Safety and Health Association, Tokyo, 1983).

[66] J. Takala: *Safety of agricultural tractors and machinery*, document presented at the Conference on Health and Safety Hazards in the Agricultural Workplace: Needs of Developing Countries, October 1997 (National Safety Council/NECAS, Illinois, United States).

[67] See, for example, sections 23 and 29 of Act No. 93 concerning occupational safety and health (Hungary); section 96 (2) (a) of the Labour Act (1992) (Namibia) and section 9 of Act No. 4 respecting workers' protection and the working environment of 4 Feb. 1997 (Norway).

[68] For a discussion of the operation of these laws in Scandinavia, see Höglund: "Agriculture" in: *The Workplace*, op. cit. For a discussion of the position in the United States, see W. G. Vause, op. cit.

[69] Council Directive 87/402/EEC of 25 June 1987 on roll-over protection structures mounted in front of the driver's seat on narrow-track wheeled agricultural and forestry tractors, *Official Journal of the European Communities* (Brussels, 8 Aug. 1987) No. L.220. See further, Manos, op. cit.

[70] Convention, art. 1 (3).

[71] ILO: *Safety in the working environment* (General Survey), op. cit.

[72] At present the Democratic Republic of the Congo.

[73] ILO: *Safety in the working environment* (General Survey), op. cit. France had not ratified the Convention as at 31 Dec. 1997.

[74] ibid. The country is not identified in the survey.

[75] See, for example: Mexico: Nom-Y-[illegible]02-1988 (1 June 1988); Seychelles: Pesticides Control Act, No. 4/1996; India: Insecticides Act 1968; Indonesia: Government Regulation of the Republic of Indonesia No. 7 concerning the control of the sale, storage and use of pesticides (1973) and Manpower Minister's Regulation on safety and health conditions in work sites managing pesticide (1986); Finland: Ordinance on Pesticides (1984); France: Decree No. 87-361 concerning the protection of agricultural workers exposed to agricultural pesticides; Brazil: Pesticides Act, 1989; Australia (New South Wales): Pesticides Act (1978).

[76] ILO: *Migrant workers*, General Survey by the Committee of Experts on the Application of Conventions and Recommendations: Report III (Part 4B), International Labour Conference, 66th Session, 1980, Geneva, para. 440.

[77] Examples of such laws include: Chile: Labour Code (1994), section 92 (temporary and permanent workers); Mexico: Federal Labour Code, section 283; New Zealand: Health and Safety in Employment Regulations (1995), Part VI; Uruguay: Law 14.785. See also the discussion of national laws concerning the housing of workers in ILO: *Health, welfare and housing of workers*, op. cit.

[78] Ethiopia: Labour Proclamation No. 42/1993, section 92 (2); Norway: Act No. 4 of 4 Feb. 1997 respecting workers' protection and the working environment, section 14 (h).

[79] Argentina: Decree No. 617/97, sections 48-50; France: Labour Code, sections L.231 2.4 and L.231-3.1.

[80] Act No. 93 concerning occupational safety and health, section 39 (2).

[81] Australia: section 21 (4) (e) of the Occupational Health and Safety Act (1985) (Victoria); Fiji: Health and Safety at Work Act (1966), section 9 (2) (c).

[82] This code of practice is entitled: *Code of practice for the provision of information in languages other than English.*

[83] Decree No. 617/97, section 50.

[84] See section 17 of Decree No. 31-92 of March 1992 concerning the modernization of the agricultural sector.

[85] International Conference on Environmental Health and Safety in Agriculture on the Boundary of Two Millenria, organized by the Institute for Occupational Health, Kiev, Ukraine, 8-11 September 1998.

CHAPTER III

ADMINISTRATION AND ENFORCEMENT OF NATIONAL LEGISLATION

This section of the report examines the difficulties associated with the administration, implementation and enforcement of safety and health in the agricultural sector. A number of member States that complied with the ILO's request for information on safety and health in agriculture stressed that the administration of legislation was one of their greatest practical problems in this regard.

Many countries provide for tripartite safety and health advisory bodies under their safety and health laws. It is less common for Ministries of Agriculture and agricultural employers and workers to be represented on such bodies.

COMPETENT AUTHORITIES AND INTER-INSTITUTIONAL COORDINATION

The safety and health legislation of many countries provides for a tripartite safety and health council, commission or other forum consisting of representatives of government, workers and employers.[1] Membership of such bodies generally comprises government representatives from the Ministries of Health, Industry, Labour or Social Security, as well as employers' and workers' representatives — and occasionally, one or more independent occupational safety and health experts. Generally speaking, these bodies are the administrative responsibility of the Ministry of Labour and they carry out one or more of the following functions:

- the development of a national policy on safety and health;
- the provision of advice to Ministers about safety and health standards such as regulations and codes of practice;
- the conduct of research into, and enquiries about, safety and health;
- the approval of training courses in safety and health; and
- liaison with relevant national and international bodies about safety and health.

However, it is not so common for the legislation establishing such bodies to include representatives from Ministries of Agriculture or to specify that agricultural employers and workers must be represented. As noted earlier in this report, an exception to this general rule is the French Labour Code which provides for a specialist tripartite forum that only addresses issues concerning safety and health in agriculture. This body is known as the National Commission of Safety and Health in Agricultural Work,[2] over which the Minister of Agriculture presides. The Commission also consists of representatives from the Ministries of Labour, Health, Industry and the Environment, as well as six representatives of agricultural employers and workers, respectively, and nine experts;[3] its role is to develop and implement a national policy on safety and health in agricultural work.[4] A further example of a tripartite safety and health body that provides for agricultural representation is the High Council for Occupational Health in the Islamic Republic of Iran. Membership of the Council includes a

representative of the Minister of Agriculture, other government representatives, employers' and workers' representatives and independent experts.[5] In Italy, a representative of the Ministry of Agriculture sits on the Administrative Committee of the National Institute for Prevention and Safety at Work (ISPEL).[6] The Venezuelan National Council for Prevention and Occupational Health and Safety includes a representative of the Minister of Agriculture as well as a representative of the Confederation of Venezuelan Peasant Farmers.[7] Further examples include: the National Council for Agricultural Work in Argentina;[8] the Occupational Hygiene and Environment Commission in Peru;[9] and the National Council of Safety and Hygiene at Work (CNHST) in Portugal.[10]

In some countries, general safety and health advisory bodies establish their own industry-specific advisory committees. An example is provided by the United Kingdom where the main safety and health statute establishes a general advisory committee known as the Health and Safety Commission (HSC).[11] The HSC has established a number of industry advisory committees including the Agriculture Industry Advisory Committee (AIAC). The membership of this Committee consists of employers and workers in agriculture, representatives of government departments responsible for agriculture and advisors from the agricultural education sector. The primary role of the AIAC is to advise the HSC on agricultural issues in general and on safety and health issues that are relevant to agriculture.

The need for the coordination of authorities is recognized in the Occupational Safety and Health Convention, 1981 (No. 155). Article 15 of the Convention requires member States to "make arrangements appropriate to national conditions and practice to ensure the necessary coordination between various authorities and bodies called upon to give effect to Parts II and III of [the] Convention". Similarly, Article 7 (1) of the Labour Inspection (Agriculture) Convention, 1969 (No. 129), requires that "so far as is compatible with the administrative practice of the Member, labour inspection in agriculture shall be placed under the supervision and control of a central body".[12]

Inspection is the most visible of governmental efforts aimed at assuring basic satisfactory conditions of employment and of health and safety at work. In the majority of countries examined, safety and health legislation is administered by the Ministry of Labour, often through a safety and health office or directorate. The receipt of notifications, the conduct of inspections and investigations and the enforcement of the laws are generally the responsibility of labour inspectors or safety and health inspectors. For example, in Bulgaria, there is one inspector in each of the 28 District Labour Inspectorates who is responsible for agricultural worksites. Sweden has between one and three labour inspectors in each of its 11 districts who specialize in agriculture. These inspectors may be assisted by officers from the Ministry of Agriculture or Health when conducting inspections or investigations at agricultural undertakings.[13] In this context, the role of such Ministry of Agriculture or Health officers is generally to provide technical advice on agro-chemicals or agricultural machinery. In a few countries such as in Argentina, France and Uruguay, the Ministry of Agriculture is the body designated to carry out safety and health inspection in the agricultural sector.

In addition to this secondary role of providing advice and support to labour and safety and health inspectors, Ministries of Agriculture, Environment or Health often have a primary responsibility for the administration of legislation specific to agricultural undertakings, such as that regulating the use of pesticides. Similarly, Ministries of Health in many countries have administrative responsibility for occupational health

inspection. In Costa Rica, the Health Ministry receives a proportion of employers' contributions to fund preventive activities in agricultural plantations.

A working paper produced in 1995 by the ILO Southern Americas Multidisciplinary Advisory Team, which examined labour law and practice in a number of Latin American countries, reported that a lack of resources for labour inspection seriously limited the effectiveness of protective labour laws in rural areas. It revealed wide disparities in the number of inspectors allocated to the rural areas and a lack of basic infrastructure and means of transportation. For example, in Chile, where the coverage of inspection services in rural areas is better than in many other Latin American countries, the number of inspectors per worker in rural areas in 1995 varied from one inspector per 16,770 workers in the region in which there were proportionately the most inspectors (Concepción), to one for 47,810 workers in the region with the lowest density of inspectorial resources (Arauco).[14] In addition, the report noted that the penalties imposed on those who broke the laws were too low to act as a serious deterrent. It also pointed out that the slow and cumbersome legal procedures involved in the prosecution of breaches of the law also hindered their effective operation.[15]

In many of the replies received by the ILO, concerns were expressed about available resources to implement safety and health laws in the agricultural sector — both in terms of the skills of their officers and the resources to which those officers have access.[16]

According to the Committee of Experts on the Application of Conventions and Recommendations, the safety and health and labour inspectorates (or inspection services) which are responsible for the enforcement of safety and health legislation "are confined mainly to the urban areas".[17] Indeed, these labour inspection services have traditionally focused on industrial hazards — and hazards associated with high risk industries such as construction and mining. What is more, the generalist inspectors in safety and health inspectorates not only often lack a technical understanding of the hazards specific to agriculture but also fail to have a knowledge of the work organization in the agricultural sector. This obviously undermines their effectiveness as enforcers of safety and health laws in the agricultural sector.[18]

For example, Viet Nam has reported that staff working in the Ministry of Agriculture and Rural Development lack qualifications in safety and health, which compromises their ability to deliver relevant services to workers and employers in the agricultural sector. Safety and health inspectors may have such qualifications but lack experience relevant to the agricultural sector.[19] Fiji, in its reply to the ILO request for information, advised that its limited resources for inspection and enforcement activities compromised the effectiveness of its recently enacted comprehensive safety and health legislation in the agricultural sector. Ethiopia, Nicaragua and Thailand indicated that they lacked the material, financial and human resources needed to cover the agricultural sector properly. Similar concerns have previously been raised by Barbados, Belize, Burundi, India, Phillippines and Somalia.[20]

There are some examples of recent initiatives on the part of certain safety and health inspectorates to increase the resources that they devote to the agricultural sector. For instance, certain countries maintain a specific agricultural safety and health inspectorate (United Kingdom, Switzerland). In the United Kingdom, the Health and Safety Executive (HSE) launched a programme in 1993 to reduce the level of injuries associated with the use of potato harvesters. The programme resulted in a 60 per cent reduction in the level of accidents and injuries between 1992-93 and 1994-95.[21] More

recently, in 1996, the HSE's Agriculture Inspectorate launched an agricultural training pack and video entitled "No Second Chances", which has been sent free of charge to all agricultural colleges in United Kingdom.

This brief overview illustrates the overlapping roles played by different government Ministries in the administration and enforcement of safety and health laws applicable to agricultural undertakings. It highlights the importance of ensuring that inspectors trained in both safety and health and agriculture are available to conduct inspections and investigations. Finally, it emphasizes the need for active coordination between the various Ministries with a responsibility for safety and health in agriculture to ensure optimal and efficient use of educational and inspectorial resources — which are often very scarce particularly in developing countries.[22]

In addition to the many informal arrangements that exist between agencies and departments with administrative responsibility for safety and health laws applicable to agriculture, several countries provide examples of formal cooperation between agencies with administrative responsibility for pesticides laws. For example, Mexico has an Inter-Ministerial Commission for the Control, Processing and Use of Pesticides, Fertilizers and other Toxic Substances. The responsibility of this Commission, which is made up of representatives of the Ministries of Industry, Agriculture, Environment and Health, include: issuing standards on fertilizer and pesticide preparation, use and disposal; and promoting research and training. The Commission also has a subcommittee for studies on agriculture, hygiene, ecology and health, which is chaired by the representative of the Ministry of Agriculture. In Panama, the National Technical Interinstitutional Commission on Agro-chemicals serves a similar purpose. The work of this Commission is coordinated by a representative of the Minister of Agriculture.[23]

Limitations due to a lack of enforcement

There are two aspects to the whole issue of the enforcement of general safety and health laws in the agricultural sector. Firstly, safety and health legislation in many countries — for example, Fiji, Hungary, South Africa and Sweden — relies for its effective operation on the participation of workers' health and safety representatives.[24] In countries such as France, Sweden and the United Kingdom, workers' safety representatives play a vital role in the enforcement of safety and health legislation.[25]

In some countries — Hungary, Namibia, South Africa — there must be a minimum number of workers at a workplace before a safety representative may be elected. Many agricultural workplaces do not meet the threshold (ten in Hungary and Namibia, 20 in South Africa).[26] Even in countries that do not prescribe a threshold, a significantly large proportion of agricultural workplaces do not have such representatives in place and this may compromise the effectiveness on the application of the legislation. Under the French Labour Code, for instance, the health and safety committees play a vital role in the enforcement of safety and health and other labour standards. Enterprises with 50 or more employers in all sectors of the economy other than mines, quarries and transport are required to form such Committees.[27] However, in practice, such Committees are far more prevalent and active in the industrialized sector than the non-industrialised sector.[28]

The second aspect to be considered when examining the enforcement of safety and health laws is that, in most countries, this task is entrusted to safety and health inspec-

tors located in a safety and health or general labour inspectorate. These inspectorates carry out the enforcement of safety and health laws envisaged under Article 9 (1) of the Occupational Safety and Health Convention, 1981 (No. 155).[29] The difficulties faced by many countries in establishing safety and health inspection services for the agricultural sector are examined in more detail below.

Concerning inspection in agriculture, it is important to note that the Labour Inspection (Agriculture) Convention, 1969 (No. 129), and its accompanying Recommendation No. 133, provide a detailed regime for an agricultural labour inspectorate.[30] Indeed, the Occupational Safety and Health Recommendation, 1981 (No. 164), stipulates, in paragraph 5, that the system of inspection provided for in the Occupational Safety and Health Convention, 1981 (No. 155), should be guided by the provisions of Convention No. 129.

Convention No. 129 recognizes, in Article 7 (3), that labour inspection in agriculture may be carried out in a number of different ways, including the establishment of:
(a) a single labour inspection department responsible for all sectors of the economy;
(b) a specialized agricultural inspection service; or
(c) other models falling between these two options.

In response to concerns raised by a number of member States about the need to establish an inspection service solely concerned with agriculture, the Committee of Experts has stressed that "the application of Convention No. 129 does thus not necessarily imply the establishment of special inspection services for agriculture".[31] However, labour inspectors in agriculture must, under Articles 9 and 11 of the Convention, be suitably qualified and adequately trained and there must be appropriate arrangements in place to "promote effective cooperation between the inspection services in agriculture and government services and public or approved institutions which may be engaged in similar activities" (Article 12).

The Plantations Convention, 1958 (No. 110), requires each member State in which the Convention is in force to "maintain a system of labour inspection" consisting of "suitably trained inspectors" (Articles 71 and 72). The competent authority is to make the necessary arrangements to furnish labour inspectors with the appropriate conditions and resources to enable them to perform their functions of securing the enforcement of protective provisions including those applicable to the safety and health of plantation workers (Articles 74 and 75).

In most countries there is a gap — varying in size — between legal provisions and practice in agriculture. The means available to labour inspection services in general, and to the inspection of health and safety at work in particular, are far less than the task requires. In Norway, despite the legislation, only one or 2 per cent of agricultural properties are inspected due to a lack of funds; an information strategy is being developed to promote health and safety at work in agriculture. In Canada, agriculture inspections are carried out on a routine basis or following a complaint or an accident.

Notification of occupational injuries and diseases

The safety and health laws in most countries require employers or occupiers of workplaces to notify prescribed occupational injuries and diseases, as well as dangerous occurrences, to the administering authority within the time period and in the form stipulated by legislation.

An example is provided by Mauritian law which requires an employer (including an employer in agriculture) to:

- notify industrial accidents, diseases and dangerous occurrences (as defined);
- report to the inspectorate within seven days; and
- record all notifications.[32]

Requirements to notify vary between countries. In certain countries, the notifications of agricultural injuries or diseases received by the competent authority are generally confined to fatalities and acute poisonings.

Under Article 8 of the Employment Injury Benefits Convention, 1964 (No. 121), national legislation should include a general definition of occupational diseases broad enough to cover at least the diseases enumerated in Schedule I annexed to the Convention (updated in 1980). A number of the occupational diseases prescribed in the schedule are particularly relevant to agriculture such as: occupational asthma, extrinsic allergic alveolitis, diseases caused by arsenic, diseases caused by asphyxiants, hearing impairments caused by noise, diseases caused by vibration, skin diseases and infectious and parasitic diseases. In 1991, an ILO group of experts proposed a new list of occupational diseases.[33] The ILO Code of Practice on Recording and Notification of Occupational Accidents and Diseases (1996) includes the proposed new list in its Annex B.

Many countries maintain a list of occupational diseases which identifies those diseases that are legally defined as being related to specified occupational activities (such as Colombia, Cuba, Mozambique, Nicaragua)[34] and an employer is generally required to notify the authority when a worker contracts a listed disease. In certain countries, the list is "open" in the sense that a worker may suffer a disease that will be considered of occupational origin although it is not listed, as long as the requisite link with work can be established on medical grounds. Many countries include in their list agricultural diseases of occupational origin. France has two separate lists, one for diseases in agriculture (*Régime Agricole*) and another for other sectors (*Régime Général*). Under Italian law prior to 1975, there were separate lists for agricultural and industrial workers. In that year the lists were combined.

Under-reporting

The International Labour Office collects and publishes global figures of accidents and diseases which are based on national recording and notification systems. However, reasonable reliable data may only be obtained from a rather limited number of countries (i.e. from about one-third of the ILO's member States). The information available is not based on harmonized recording and notification systems. Under-reporting is common, and in many countries the reporting and compensation systems cover only selected economic activities leaving out major sectors, such as agriculture, that are known to have higher than average accident frequency rates. National variations over time may also be influenced by modifications in coverage, regulations, reporting procedures or changes in economic conditions. Under-reporting is also partially explained by the difficulties involved in establishing the employment status of agricultural workers such as piece-rate, full-time or part-time workers, seasonal and migrant worker, etc.[35]

In many countries the problem of poor health coverage for workers is compounded by the fact that medical personnel are inadequately trained in the identification of the

occupational causes of ill health. Recognition criteria and declaration procedures are not always appropriate, thus encouraging failure to report. Even though the causal agents of many occupational diseases, as well as the mechanisms of action of those agents, are widely documented, the level of diagnosis and reporting is low; workers are thus deprived of proper treatment and appropriate preventive measures. Most of the available data is drawn form epidemiological studies which remove any doubt concerning the causal relationship between risk factors and the appearance of certain diseases in agricultural work. However, this data cannot in any way be extrapolated to the number of cases throughout the world. This situation is particularly serious given that many workers are exposed to risks associated with rapid changes in agricultural production processes and with an increasing use of hazardous substances.

As only relatively few accidents are fatal, available information on workplace accidents do not reflect the very many non-fatal and minor injuries which fail to be reported. When an occupational injury is a cause of death, this fact is often missing from the death certificate. Furthermore, there is much variation between the accident rate in different agricultural activities.

Under-reporting in the agricultural sector is common to both industrialized and developing countries. During the 1989-90 period, the HSE (United Kingdom) sponsored a supplement of questions to the 1990 Labour Force Survey to try and ascertain the true level of workplace injuries and ill health; this confirmed the degree of under-reporting in the main industries. The survey was based on interviews with approximately 77,000 workers in all sectors. The reporting criteria included absence from work for more than three days but not fatal injuries. The data confirmed that under-reporting was particularly severe in agriculture. Only 19 per cent of all injuries were reported during this period; self-employed farmers reported far less than employers.[36]

Until quite recently — in the late 1970s — the accidents of self-employed farmers were not registered in Sweden, despite the fact that they constitute about 90 per cent of the agricultural workforce. Since that time they have also been included in the statistics. In 1987, the Swedish Farmers' Safety and Preventive Health Association undertook a study on occupational accidents among 20,000 farmers and forestry owners. The result showed that the number of accidents reported in this way was about twice as high as those registered in official statistics.[37] In another study carried out in hospitals and health centres to investigate work-related and home injuries in farms between 1978 and 1990 in Sweden, the level of under-reporting was calculated by making a comparison between the number of emergency cases reports completed and the emergency consultation lists. The total loss in registration of all emergency visits was 9 per cent.[38]

Problems in diagnosis of diseases also led to under-reporting in the vast majority of countries. Chronic conditions due to noise, vibration, low exposure to dusts or pesticides are more difficult to evaluate due to their long-term effects and uncertain symptoms. For example, reliable data on pesticide poisoning is difficult to obtain because only acute poisoning is reported, as it is likely to leave visible and immediate effects, requires hospitalization and may lead to death. By contrast, cumulative low exposures to pesticides are often not recorded because the symptoms are imprecise and the effects may show only after a long period of time.

Figures on acute intoxication from pesticides frequently come from poison units in hospitals which, to a great extent, register cases of accidental poisoning, suicide or attempted suicide. These data hide the real magnitude of statistics related to pesticide

poisoning and may give the impression that suicides are more significant when compared with occupational exposures than is actually the case. However, this state of affairs may be attributed to the immoderate availability of agricultural chemicals and the lack of information and control on their sale to individuals. In Sri Lanka, where there is a high incidence of suicide,[39] organophosphate and carbamate pesticides were responsible for 35.7 per cent of total hospital admissions with 21.8 per cent of deaths over a 21-month period during 1995 and 1996.

In Costa Rica, there were 392 acute cases of poisoning recorded by the Social Security Fund in 1981, whereas a detailed study of hospital admissions in a banana-growing region (Guapiles Hospital) revealed 373 cases of occupational poisoning in the same year.[40]

Compensation schemes for occupational injuries and diseases in agriculture

In most countries, the compensation of occupational injury and diseases is part of the broader social security system. The coverage of agricultural workers under national social security schemes has traditionally been limited. In industrialized countries, there has been a gradual extension of national schemes during the twentieth century to include agricultural workers.[41] However, in a large number of countries, agricultural workers are rarely covered by any recording and notification system and are excluded from any employment injury benefit or insurance scheme.

The extent of coverage of agricultural workers under national occupational injury and disease compensation schemes also varies. In certain countries self-employed farmers only have access to social security benefits on a voluntary basis by paying their own contributions. Even when agricultural workers are not excluded from such schemes, the ILO pointed out that "there is no guarantee that coverage is indeed effective, as a number of practical and regulatory obstacles can and do arise" such as the exclusion of casual labourers, the requirement for minimum working periods or a lack of administrative services for the processing of claims in rural villages.[42] Many countries impose a qualifying period before a worker is eligible for benefits. For example, in Italy, workers must work for a minimum of 90 days before they qualify for benefits.[43] Mexico makes special provision for rural workers in Chapter 10 of its Social Security Law.[44] Nonetheless, coverage of certain agricultural labourers such as temporary and seasonal workers remains sporadic at best. In the first place, 13 per cent of the countries surveyed by the ILO in 1993 specifically excluded agricultural workers.[45] For the reasons cited above, access to compensation schemes in countries that do not specifically exclude agricultural workers is also fraught with difficulties, particularly for migrant labourers.[46]

Fewer than 20 per cent of the world's agricultural wage-earners are covered by one or more of the nine contingencies of the Social Security (Minimum Standards) Convention, 1952 (No. 102). These are: medical care, sickness and maternity benefits, family benefits, unemployment benefits, employment injury, invalidity and survivors' benefits and old-age benefits.[47] A worldwide survey of 147 countries conducted in 1993 concluded that 13.1 per cent of countries specifically excluded agricultural workers from old-age, disability and survivors' benefits and 7.8 per cent excluded such workers from sickness and maternity benefits.[48] The position of agricultural workers is worse in some regions than others.[49] In Africa, for example, social security schemes

often exclude agricultural workers, particularly those who are not wage-earners. The proportion of the *overall* African workforce covered by social security schemes in the 20 countries for which data was available in 1987 ranged from between 0.7 per cent and 20 per cent.[50]

The level of protection varies considerably among countries. In certain countries such as Israel and Australia, agricultural workers are entitled to the same levels and types of compensation as other workers who sustain illness or injury that is work-related.[51] In Luxembourg, the Accident Compensation Scheme covers all workers but is voluntary for agricultural workers who work on land of 1/2 hectare or less.[52] Ecuador has established an Insurance Scheme for Agricultural Workers.[53] Agricultural workers in Bulgaria and Sweden enjoy the same social security protection as other workers.[54] The Japanese workers' compensation laws exclude agricultural undertakings employing fewer than five workers.[55] In Finland, specific legislative schemes are in operation to compensate workers that are injured or made ill in the course of agricultural work.[56] The German "Agricultural Accident Insurance System" provides coverage for agricultural employers, workers and the spouses of employers. In Uruguay, a Decree provides for an insurance scheme for accidents and diseases in rural enterprises.[57] Similarly, in Sri Lanka legislation provides for a pension and social security scheme for farmers.[58]

Workers' and employers' participation in health and safety through collective agreements

Collective agreements are an important source of employers' and workers' labour rights and responsibilities. In the area of safety and health, however, the major source of rights and responsibilities tends to be statutory and quasi-statutory instruments and standards. In most countries, this is particularly the case in the agricultural sector where low rates of unionization make collective bargaining the exception rather than the norm.[59]

An examination of both national laws relating to collective labour agreements and the agreements themselves has revealed little information as to the way in which safety and health issues in agriculture are covered. Generally speaking, collective agreements make reference to certain safety and health issues such as protective clothing, safety equipment, transport in the event of accidents, first aid, safety procedures, safety committees, medical examinations, accident insurance and certain allowances. Competent authorities in the area of safety and health have, in a number of countries, including Canada (Quebec) and Australia, produced guidance material to help employers and trade unions reach agreement on safety and health issues in the process of collective bargaining.

In countries such as India, collective agreements often refer to a commitment on the part of the employer, the union and the workers to cooperate through safety committees in an effort to improve safety and health at the workplace. In some jurisdictions, such as British Columbia in Canada, there are statutory minimum conditions that are applicable to safety and health and negotiated conditions of work may not fall below these statutory standards.[60]

In Ukraine, there is a statutory requirement that collective agreements must provide workers with "an assurance of social guarantees in the field of workers' protection at least up to the standard prescribed by legislation and shall rehearse their respective

obligations and all the measures designed to apply the established safety and health standards for the workplace . . .".[61] The legislation in Viet Nam contains a similar requirement.[62] In Bulgaria, a collective agreement has been reached between the Federation of Independent Trade Unions in Agriculture and the Ministry of Agriculture, Forestry and Land Reform. Articles 49 and 50 of the agreement specify the employers' duties in relation to occupational safety and health.

The participation of workers, employers and their representatives in occupational health and safety varies greatly from country to country. In developed countries, legislation does generally impose a responsibility to involve workers and employers in safety and health committees in agricultural enterprises as well as in national programmes of prevention of work-related accidents and illnesses, but in most cases their activity is very limited in this field.

A number of unions and other associative organizations also promote awareness, information and training in the subject in collaboration with Ministries of Agriculture, Labour and Social Security, as well as with universities and research centres. In some countries they provide occupational and curative medical services at work. In 1994, the ILO conducted a study of 16 organizations — ten of independent workers and six of wage-workers — spread through Asia, Africa, Latin America and the Caribbean. All 16 had health services created at the instigation of their members. Fifteen of them had received substantial external financial help to set these services up — and of these two required continued financial support to maintain the service, while a third closed down after the subsidy ended.[63]

Most collective agreements in agriculture do not cover health and safety issues. At most they are likely to refer to the legislation on the subject. However, in some countries, such as Norway, Ukraine (state and collective farms), United Kingdom and the Philippines, agreements do make reference to the issue. As a result of the reorganization of the trade union movement in Brazil in the 1980s, safety and health concerns of workers became a key issue; consequently, training weeks on safety and health for workers were organized (SEMSATs) which led to the creation of specialized secretariats dealing with safety and health matters within several trade unions and to the establishment of a national trade unions' centre for training and advice on safety and health (DIESAT) which is very active to date. In the agricultural sector, there is a strong tradition of collective bargaining, with strong employers' and workers' organizations backed by a wide membership. Negotiated agreements can be very detailed, covering wages, working time, rest days, leave, conditions of transport of workers, health and safety at the workplace, occupational injury benefits, etc.

In general, collective bargaining agreements are concluded in those sectors and enterprises where permanent employment is significant and tend to reflect the concerns of permanent workers. Temporary and seasonal workers, who are often in the majority, may not be covered — or only partially. Their frequent change of employers is considered a major obstacle. An attempt to overcome this complication has been made in France with an amendment to the Labour Code (section 127/1) which introduces the notion of a "pool of employers". Such a pool can legally contract with one or more workers under one collective agreement which specifies the terms and conditions of employment; details regarding times and periods of work are subsequently agreed upon by the respective employers. Several agricultural enterprises can thus share one or more workers, the full employment of whom might be beyond the capacity of any one enterprise.[64]

Notes

[1] Examples include Bulgaria: National Council on Working Conditions established by the Health and Safety at Work Act 1997; Mexico: National Consultative Committee on Safety and Hygiene at Work established by sections 114-119 of the Federal Act on Safety, Hygiene and the Environment; and Venezuela: National Council for Prevention and Occupational Health and Safety established under section 8 of the Basic Act on Prevention, Working Conditions and the Working Environment (10 July 1986).

[2] See Division III, Sub-division II.

[3] Section R. 231-26.

[4] Section 231-25.

[5] See the Iranian Labour Code (1990): Chapter 4 and, particularly, section 86.

[6] See Decree No. 619 of 31 July 1980.

[7] See section 9 of the Basic Act on Prevention, Working Conditions and the Working Environment (10 July 1986).

[8] An administrative body within the Ministry of Labour.

[9] Established by Decree 025-81TR.

[10] Established by section 1 of Decree No. 204-82.

[11] The composition and the functions of the Commission are outlined in Part 1 of the *Health and Safety at Work Act 1974*.

[12] Article 4 (1) of the Labour Inspection Convention, 1947 (No. 81).

[13] For example, in Algeria, Bahrain, Guyana, Israel, Libyan Arab Jamahiriya and Malawi; see ILO: *Labour Inspection: General Survey by the Committee of Experts on the Application of Conventions and Recommendations*, International Labour Office, Geneva, 1985.

[14] ILO: Southern America's Multidisciplinary Advisory Team: *La Justicia Social en el Desarrollo Rural Chileno. Aspectos laborales en el libre commercio*, Working document, No. 25 (Santiago, 1995). See also: M. Vanackere: "Conditions of agricultural day-labourers in Mexico", in *International Labour Review* (Geneva, ILO), Vol. 127, No. 1, 1988, where similar conclusions are reached about the application of Mexican labour laws to agricultural undertakings.

[15] ibid.

[16] Several countries referred to problems concerning the inadequacy of financial, human and material resources of inspection services [in agriculture] in practice as reasons for non-ratification of Convention No. 129 in their reports to the Committee of Experts on the application of Conventions and Recommendations. See ILO: *Labour Inspection: (General Survey)*, op. cit.

[17] ibid.

[18] For a discussion of the merits and problems of generalist versus specialist safety and health inspectorates, see W. Von Richthofen: "Labour inspection", in J. M. Stellman (ed.): *Encyclopaedia of Occupational Health and Safety*, 4th ed., Vol. 1 (ILO, Geneva, 1998).

[19] In Viet Nam there are 170 labour inspectors with responsibility for safety and health inspections at 38,000 enterprises.

[20] ILO: *Labour Inspection: (General Survey)*, op. cit., para. 310.

[21] G. Ungay: "The control of machine and tool safety: A strategy for reducing fatal and serious accidents on agricultural machinery" in *Proceedings of the XIVth World Congress on Occupational Safety and Health* (Instituto Nacional de Seguridad e Higiene en el Trabajo, Madrid, 1997).

[22] ILO: *Labour Inspection: (General Survey)*, op. cit.

[23] The Commission is established by Act No. 28 of 26 December 1990.

[24] Fiji: Health and Safety at Work Act 1996, sections 16 and 17; Hungary: Act No. 93 concerning occupational safety and health, sections 70-76; Republic of South Africa, Occupational Health and Safety Act 1983, section 17; Sweden: Working Environment Act 1977, Chapter 6.

[25] For an excellent comparative study of the role of employee representatives under safety and health laws in these countries as compared to the United States of America, see J. E. Korostoff, L. M. Zimmerman, C. E. Ryan: "Rethinking the OHSA approach to workplace safety", op. cit.

[26] Hungary: Act No. 93 concerning occupational safety and health, section 70 (1); Namibia: Labour Act 1992, section 99 (1); Republic of South Africa: Occupational Health and Safety Act 1983, section 17 (1).

[27] French Labour Code, section L. 231-1-1.

[28] See the official French government statistics quoted in J. E. Korostoff et al., op. cit.

[29] Art. 9 (1) provides that "the enforcement of laws and regulations concerning occupational safety and health and the working environment shall be secured by an adequate and appropriate system of inspection".

[30] The Convention had been ratified by 38 countries as at 31 December 1997. For a discussion of the difficulties faced by some countries in relation to ratification, see ILO: *Labour Inspection (General Survey)*, op. cit.

[31] ibid.

[32] Occupational Safety Health and Welfare Act (1988), sections 63 and 64.

[33] A discussion of the relevant issues considered by the meeting are contained in M. Lesage: "Work-related diseases and occupational diseases: The ILO international list" in J. M. Stellman (ed.): *Encyclopaedia of Occupational Health and Safety*, 4th ed., Vol. 1 (ILO, Geneva, 1998).

[34] Colombia: Decree No. 1295 of 1994; Cuba: Law No. 13 for Protection and Hygiene at Work (28 December 1977); Mozambique: Labour Act 1988, section 143 (2) (c); Nicaragua: Labour Code, section 111.

[35] V. Forastieri: "Information note: The ILO programme on occupational health and safety in agriculture", 1997. <www.ilo.org/public/english/90travai/sechyg> ILO.

[36] G. Stevens: "Workplace injury: A view from HSE's trailer to the 1990 Labour Force Survey", in *Employment Gazette* (London), No. 100/12, Dec. 1992.

[37] S. Höglund: "Agriculture", in *The workplace*, op. cit.

[38] L. Schelp: "The occurrence of farm-environmental injuries in a Swedish municipality", in *Accident Analysis and Prevention* (Oxford, 1992), Vol. 24, No. 2.

[39] At least 40 suicides per 100,000 population each year, compared with 8 per 100,000 in the United Kingdom.

[40] L. E. Castillo Martinez, H. C. Wesseling: *Diagnóstico de la problemática de los plaguicidas en Costa Rica*, Pesticide Programme (National University of Costa Rica, 1988).

[41] For example, sickness insurance was extended to agricultural workers in Germany in 1972; accident insurance became available to agricultural workers in France in the early 1970s: see ILO: *Wage workers in agriculture*, op. cit.

[42] T. G. Ison; ILO: "Workers' compensation systems: Overview" in *Encyclopaedia of Occupational Health and Safety*, op. cit.

[43] See Law No. 457 of 8 August 1972.

[44] Section 235 provides for the self-employed; section 236 for small-scale farmers and section 238 is concerned with "social solidarity" for indigenous people, vulnerable workers and those in extreme poverty.

[45] ILO: *Wage workers in agriculture*, op. cit., table 5.2.

[46] For a discussion of the problems faced by migrant workers in accessing occupational injury compensation in South Africa, see ILO: Southern African Multidisciplinary Advisory Team: *The social protection of migrant workers in South Africa* (Harare, 1997).

[47] ILO: *Wage workers in agriculture*, op. cit.

[48] United States Department of Health and Human Services: *Social Security programs throughout the world, 1993* (Washington, DC, 1994), quoted in ILO: *Wage workers in agriculture*, op. cit.

[49] The problems faced by developing countries attempting to establish social security systems are discussed in S. Guhan: "Social security options for developing countries", in *International Labour Review* (ILO, Geneva) 1994, Vol. 133, No. 1.

[50] J. V. Gruat: "Social security schemes in Africa: Current trends and problems", in *International Labour Review* (ILO, Geneva), 1990, Vol. 129, No. 4.

[51] H. Chayon: "Employment Injuries Insurance and Compensation in Israel", in *Encyclopaedia of Occupational Health and Safety*, op. cit. See also Australia (Victoria): Accident Compensation Act 1985 (Vic.)

[52] Act of 17 November 1997.

[53] Legislative Decree No. 21 of 12 May 1986.

[54] Bulgaria: Labour Code 1951, Section III; Sweden: information supplied in reply to ILO request for information.

[55] Workmens' Compensation Act (1947).

[56] Finland: 1981 Act Respecting Accident Insurance for Farmers.

[57] Decree 623/988 of 5 October 1988.

[58] Farmers' Pension and Social Security Benefit Scheme Act No. 12 of 1987.

[59] For a general discussion of collective bargaining in the rural sector, see ILO: *Wage workers in agriculture*, op. cit.

[60] For example, under the Employment Standards Act there are minimum standards for special clothing.

[61] Workers' Protection Act of 14 October 1992: section 22.

[62] Labour Code: section 46 (2).

[63] ILO: *Special services of rural workers' organizations. A worker's educational manual*, 2nd ed. (revised) (Geneva, 1994).

[64] F. Bouquelot, op. cit.

CHAPTER IV

SAFETY AND HEALTH PRACTICE IN AGRICULTURE

WORKING PRACTICES AND WORKING CONDITIONS

As mentioned earlier in the text, agriculture is characterized by the fact that a number of work settings exist alongside each other. Today, there is a wide variety of types of landholdings, such as micro-holdings; small family farms; large privately owned or state enterprises; collective and communal properties; latifundia; lands held by squatters without deeds, etc. Production techniques vary mainly according to the size of a holding, its financial resources and the crops it cultivates. Properties may be broadly divided into four types:

- large holdings devoted to intensive and extensive industrial production geared to export which use advanced technology, large amounts of chemical inputs and complex machinery;
- medium-sized properties, which produce for both the domestic and the export markets, and employ a combination of manual and mechanical methods;
- small farms combining almost exclusively manual and traditional techniques with small-scale cattle-raising;
- micro-holdings practising subsistence agriculture, with a very small marketable surplus sold in local markets.

The application of safety and health measures in agricultural work and agricultural workplaces is more difficult than in industry. Many agricultural jobs involve multiple tasks and multiple locations, both on a daily and seasonal basis. Some of the specific features of agricultural work which may be mentioned are:

- the fact that most of the tasks are carried out in the open air, exposing the workers to climatic conditions;
- the seasonal nature of the work and the urgency of certain tasks in specific periods;
- the variety of tasks to be performed by the same person;
- the type of working postures and the length of the tasks performed;
- the contact with animals and plants, thus exposing workers to bites, poisoning, infections, parasitic diseases, allergies, toxicity, and others health problems;
- the use of chemicals and biological products;
- the considerable distances between workers' living quarters and workplaces.

As international trade intensifies, the agricultural sector is obliged to modernize the techniques used in the planting, care, treatment and harvesting of crops, as well as in animal husbandry. The introduction of increasingly complex machinery and numerous chemical compounds, each bringing potentially harmful human and environmental effects in their wake, fails to be accompanied by appropriate information and training.

In developing countries, work during harvesting in large agricultural enterprises is carried out at an unflagging pace, causing extreme tiredness and accidents due to a lowered level of vigilance. The hazards inherent in agricultural work are compounded by the fact that workers have little control over the pace, content and organization of

their work. Safety and health standards are not always observed, even if they are better than those applied in other smaller enterprises, where risk-prevention programmes are almost non-existent. Occupational safety and health measures are often limited to curative interventions and measurement of work capacity. Conditions of hygiene in accommodation for temporary workers are usually poor.

In those countries in which highly diversified agriculture is practised, the wide variety of crops grown (including non-indigenous crop cultivations) and harvesting and post-harvesting processes have created the need for many specialized types of farm equipment. Even though the cost of such specialized machinery is generally high, its use is often highly seasonal and of short duration. A number of interrelated factors, including soil type, climatic conditions and cropping schedules, determine the time available for cultivation.

The fact that equipment is often only used for short periods of time is another factor contributing to occupational accidents. Workers are expected to be able to switch from one type of equipment or tool to another, depending on the season and the type of crop used and have little opportunity to become totally proficient in the use of this equipment. On-the-job training is generally the norm and this is often insufficient to avoid the risk of accidents.[1] A majority of manual workers throughout the world are involved in agricultural activities and injury rates are high. Injuries include amputations of limbs, eye wounds and other disabling injuries.

A large proportion of agricultural production in developing countries and in the Commonwealth of Independent States (CIS), and in Central and Eastern Europe is labour-intensive. A high percentage of the population in these countries, including women, children and the elderly, are engaged in small-scale agriculture.

Working conditions are extremely harsh for the vast majority of small-scale farmers, sharecroppers and tenants in developing countries. Not only is their social protection, formal technical training and technical assistance inadequate; it is often totally lacking.

Many medium and small-scale farms have no access to or are unaware of technological innovations. They use old and poorly maintained tools, machinery and equipment both in the spraying of pesticides and in crop production, which are often the source of illnesses and severe accidents. Access to health services is limited due to the geographical dispersion of the population and the low number of rural medical centres. Economic pressures and lack of training lead to an excessive expenditure in terms of physical labour, psychological stress and imbalances in the pace of work — all of which increase the risk of accidents and illnesses. Small-scale farmers have additional problems. Their raw materials and equipment are of inferior quality and funding for their production is extremely limited. They usually are not organized, have no representative body and tend to deal with their problems individually. Furthermore, most small-scale farming is located in rain-fed areas and hinterlands such as hillsides or undulating land without irrigation systems and unpredictable rainfall (such as the Deccan Plateau in India, South-East Asia, certain regions in Latin America, and sub-Saharan Africa). Climatic, geological and geographic conditions vary considerably. Farming systems are labour intensive and less productive compared with those of commercial plantations and large-scale farms. Manual operations are physically demanding in terms of energy, postural requirements and hand tools used and are commonly sources of strain (exertion). Land preparation tasks are the most arduous

because they require considerable time and energy. Weeding is very strenuous and the time schedule is crucial for both daily and seasonal tasks.[2]

Ergonomics and technology transfer

In industrialized countries, new micro-processors and electronic technologies are being introduced in all areas of machinery and equipment design in order to monitor machine and engine functions electronically. The introduction of complex multiple controls in modern tractors and combine harvesters often overloads the capacities of operators and may thus be a contributing factor to accidents. When adequate safeguards are not provided, on-board electronic control systems are subjected to the electromagnetic environment near high voltage electrical transmission lines, communication equipment, and natural phenomena.[3]

Current ergonomic research and its application in developing countries is mainly focused on the industrial sector. Little work has been done in the agricultural sector — and even less at the small-scale farmer level. There is limited information on the extent to which ergonomics may alleviate the constraints on manual operations for crop cultivation.

In most developing countries, problems due to the transfer of technology have ergonomic implications. Most new technology comes from industrialized countries and is rarely appropriate either to the climate and working and cultural habits of the developing countries or to the body size and physical strength of workers in these countries. In many cases, equipment and tools, as well as environmental and organizational factors, are not properly matched to those who use them. This obviously creates unsafe, unhealthy and uncomfortable situations. There are also considerable variations in body measurements in developing countries in which there are different ethnic groups. For example, Chinese have shorter and narrower hands with longer fingers that Europeans and Indians. These variations may have limited ergonomic implications or lead to serious ergonomic problems both in terms of the equipment and the users — resulting in accidents and injuries. There are many examples of cases of static work positions, unnatural body positions and musculoskeletal complaints which are due to these factors.

The anthropometric parameters of tool and equipment design correspond to model populations in the countries producing them. Some tools are well-adapted to workers' needs, but often tools which were originally designed for a particular task are used for quite different jobs. For example, a worker may be forced to adopt a poor posture by digging with a hoe that was intended for weeding or by lifting potatoes with a short spade designed for digging irrigation channels. Furthermore, the increased level of energy requirements for heavier work due to incorrect adaptation of equipment and machinery may increase physical and mental workload and provoke undue fatigue.

There are also repercussions from the increase of technology transfer in developing countries. Machinery which is frequently imported from industrialized countries or handed down from large to smaller enterprises as second-hand machinery often comes with dilapidated or missing safety guards; furthermore, the maintenance of machinery is usually poor. Farm implements, suitable for a particular operation, are used for others which may be inappropriate. Sometimes badly damaged farm implements are used.

The degree to which the importer ensures that machinery and equipment in developing countries is adapted to local conditions is limited by restrictions such as availability of funds, technical know-how, market policies, etc. Design considerations should be kept in mind in the selection of the imported technology order to adjust and adapt it to suit the local workforce and processes. In the case of labour-intensive cultivation which is more frequent in developing countries, ergonomic research applied to manual handling and hand tools is necessary.

However, there are successful examples of adjustments made to local technologies through ergonomic measures. In the 1990-92 period, the Institute for Agricultural Research, Samara, under the Federal Ministry of Science and Technology, undertook a project, in collaboration with the Agricultural Mechanization Research Programme of the Ahmadu Bello University in Zaria, Nigeria, for the development of agricultural technologies adapted for rural women engaged in subsistence agriculture. The project was carried out in Kanu State, Kadina State (Savannah Region of Nigeria). The project dealt with the introduction of specific technologies in operations involving land preparation, ridging and weeding, crop threshing, milk processing, oil extraction, cooking stoves and water transportation. Prototype equipment was developed and feedback from women farm groups proved to be positive for the improvement of the prototype's design. The project was successful in generating a sense of awareness of the need to help women in their farm and family activities through low-cost and easy-to-use technological improvements. It also contributed to the generation of extra income for the individual members and the community groups as a whole.

Occupational accidents in agriculture

As mentioned in Chapter I, agriculture is one of the most hazardous sectors in many countries. In addition to the ILO-estimated 170,000 casualties among agricultural workers each year, a high number of the world's 1.3 billion agricultural workers suffer serious injuries or occupational diseases.[4] Whereas occupational mortality rates declined in other dangerous occupations such as mining and construction throughout the 1990s, those in agriculture have continued to rise, both in the industrialized and developing countries. The increasing use of pesticides and machinery in recent years has increased the risk of occupational diseases and injuries. Workers in developing countries are especially at risk due to inadequate education, training and safety systems. The main causes of accidents are due to physical, mechanical, ergonomic, chemical and biological hazards.

According to the Statistical Office of the European Communities (EUROSTAT), 348,300 agricultural accidents involving more than three working days lost and 900 fatalities were recorded in 1994, placing agriculture as the second most hazardous sector in the region.[5]

In 1996, the United States recorded 710 deaths and 150,000 cases of permanent disability due to occupational accidents in the agricultural sector. The mortality rate declined from 24 per 100,000 workers in 1992 to 21 in 1996, with a peak of 27 in 1993. These figures excluded properties with less than 11 employees and workers under 16 years old.[6] A study on farm accidents among children and adolescents carried out in this country revealed that children who worked in agriculture suffered more than 23,000 injuries and 300 fatalities every year.[7] A similar study carried out in 1997 in

Table 4.1. Occupational accidents and fatalities in Europe

Sectors	Accidents with > 3 lost workdays		Fatalities	
	Number	Frequency (nb/10^5)	Number	Frequency (nb/10^5)
Construction	858 129	9 014	1 457	14.7
Agriculture	348 309	6 496	770	14.0
Transportation/Communication	421 133	6 139	917	13.7
Manufacturing	1 515 556	5 071	1 330	4.6
Commerce	487 656	2 552	519	2.8
Hotels/Restaurants/Services	405 317	5 759	380	4.1
Others	881 966	4 539	5 373	6.1
Total	4 918 066		6 423	

Source: Eurostat, 1994.

North Carolina showed that more than one-third of teenagers working in farms reported exposure to pesticides and accidents with tobacco harvesters. Other common reported injuries included accidents with large animals, insect stings, cuts, burns, and falls.[8]

In France, the number of temporary and replacement workers in agriculture and livestock-raising rose by 0.3 per cent between 1995 and 1996. The frequency rate of accidents among them was 81.4 in 1996. This was, however, a 6.2 per cent improvement over 1995 figures. In 1996, women accounted for 14 per cent of the victims of accidents involving days away from work; in the 1994-96 period, they accounted for 5 per cent of fatal injuries. Persons under 20 years of age accounted for 5 per cent of accidents involving days away from work in 1996 and 4 per cent of fatal injuries between 1994 and 1996. Recently recruited workers, declared as having been employed for less than one year, were the most affected by work accidents, accounting for 37.3 per cent of accidents involving days away from work in 1996 and 34.7 per cent of fatal injuries between 1994 and 1996.[9]

In developing countries the situation is even worse. According to data from the National Pension Fund in Mauritius for the 1986-88 period, it was estimated that more than two out of every ten workers on sugar plantations had an occupational accident (10,000 accidents per 44,000 workers).[10] In Puerto Rico, one-third of all accidents were related to agriculture.[11] Furthermore, the Puerto Rico study shows that a high proportion of injuries was due to manual cutting instruments such as knives, machetes, sickles and others.

In 1983 the Social Security Fund of the Côte d'Ivoire received some 1,950 reports of workplace accidents in agriculture. The most frequently cited causes were moveable parts of machinery (13 cases), lack of personal protective equipment (21 cases), inadequate information on occupational hazards (14 cases), and non-existent or inadequate training (12 cases). The Labour Inspectorate reported an average of 175 accidents per year between 1989 and 1994 in one sugar-cane production company alone, which employed a total of 2,000 workers. This represented almost one accident for every ten workers — of whom almost two thirds were temporary workers. The accidents particularly involved machetes, machines, snake bites, injuries from the sugar-cane itself and injuries occurring in transport accidents.

Severe injuries, such as fractures and wounds, are also caused by the handling of cattle and other farm animals. Contact with wild animals may also give rise to serious accidents. In countries such as Brazil, Cote d'Ivoire and the Cameroon, which have hot and humid climates and an abundant vegetation, snake bites are frequently cited as an agricultural accident — even though there are few statistics which include these accidents among others of occupational origin.

Table 4.2. Distribution of occupational accidents: Costa Rica (1994), Brazil (1994) and United States (1995)

Causes of occupational accidents	Costa Rica 1994 (%)	Brazil 1994 (%)	USA 1995 (%)
Tools and machines	50	52	32
Falls and slips	25	7	19
Overstrain, repetitive movements	7	7	22
Foreign bodies in the eyes	2	n.a.	n.a.
Pesticides and other chemical products	1	2	5
Transport accidents		2	5
Others	18	8	17

n.a. = not available.

Source: Dirección Actuarial del Instituto Nacional de Seguros, Costa Rica, 1994; MEIRELLES C.E.; FUNDACENTRO, Brazil, 1994; National Safety Council (NSC): *Accident facts* (Itasca IL, United States, 1997).

Accidents with tractors and agricultural machinery

In France, where there is a very good system of social security coverage for the agricultural sector, accidents as a whole are on the decrease. However, mechanization is still the main cause of injury accounting for 25 per cent of all cases; of these, 30 per cent involve tractors and agricultural mobile machinery and almost 13 per cent hand tools, while 10 per cent are caused by working with animals and 8 per cent by soil conditions. One accident in three gives rise to permanent disability and accounts for 30 per cent of compensation costs.[12]

In Spain and other European countries at a similar level of development, some 40 per cent of accidents are machinery-related and half involve tractors alone.[13] Australia reports that farmers and farm workers are the largest group to be fatally injured in tractor incidents: most of the injuries which occurred between 1989 and 1992 were caused by roll-overs or incidents when the worker fell off or climbed down from the tractor and was subsequently run over by the tractor or whatever it was towing.[14]

A number of African countries have registered a significant increase in occupational accidents since tractors and trucks have been introduced in sugar-cane production.[15] In Argentina, between the months of April and June 1997 alone, agricultural machinery was the cause of 29.9 per cent of non-fatal injuries and 4.2 per cent of fatal

injuries. Finally, Colombia reported that 50 per cent of all accidents occurring in the agricultural sector in 1996 involved tractors. Most of these accidents resulted from tractors rolling over after one of its wheels had gone into a furrow or from vehicles working on excessively steep inclines or having an uneven distributed load. In 1993, almost 300 occupational deaths were attributed to the fact that tractors were not equipped with systems of roll-over protection or safety belts. Such changes are either considered too costly to carry out or to undermine the efficiency of the vehicle; in some cases, they are simply technically impossible on old machines.

Available data from developing countries show that there has been an increase in the accident rate and that such accidents occur mainly among migrants and daily workers as well as women and children, whose numbers at work are constantly rising. In most countries farming machinery may be used not only by machine operators especially trained for these purposes but also by women, older children and teenagers. For example, 62 per cent of fatal farm injuries among children and adolescents in the United States involved tractors in 1989. A study carried out in North Carolina in 1997 among teenagers working on farms showed that adolescents were exposed to safety hazards such as accidents with tractors, all-terrain vehicles, farm trucks, and rotary mowers. The total fatality rates increased with the age of the child. The rate for 15 to 19 year-old boys was double that of young children and 26-fold higher than for girls.[16]

However, since 1983, all tractors — old and new — in Sweden have to be equipped with a roll-over protection system; the law of 1959 is also fully applicable to family farmers and has resulted in a important reduction of fatalities caused by roll-over accidents, decreasing from about 40 cases per year to almost zero.[17]

Accidents in silos and other deposits

In farms where silos are used to store grain there is a significant risk of death from asphyxia. In a newly filled silo, various extremely toxic nitrogen oxides begin to accumulate in the head-space of the silo within hours of its filling and may persist there for a week or more. Levels of nitrogen dioxide that are hundreds of times higher than industrial standards have been recorded. Treatment must be appropriate and rapid to avoid fatal consequences. When a hermetically sealed silo is opened, there is a danger of asphyxia since the seeds and the fodder will have given off carbon dioxide, which will reduce the oxygen content of the air to below the essential minimum.[18] Falls followed by asphyxia arising from the inhalation of grains have also been reported. Many countries have long lists of recommendations concerning the risks of working in silos, but they are usually not properly followed.

Occupational and work-related diseases

Diseases caused by agricultural work vary considerably in different parts of the world and are conditioned by a range of factors such as climate, fauna, population density, living conditions, eating habits, standards of hygiene, level of education, occupational training, working conditions, technological development, quality of and access to services, etc.

The following distinctions can be made:

(a) occupational diseases, having a specific or a strong relation to occupation, generally with only one causal agent, and recognized as such;
(b) work-related diseases, generally with multiple causal agents, where factors in the work environment may play a role in the development of the disease;
(c) general diseases affecting working populations, without causal relationship with work but which may be aggravated by work.

The classification of diseases under each of these headings changes over time as a result of the development of:

- the knowledge of risk factors and how they operate;
- the diagnosis technologies;
- the monitoring and prevention of the diseases that those risks can cause; and
- the production processes in agriculture.

Most countries draw up a list of diseases which are legally classified as occupational diseases for which compensation may be claimed in certain circumstances and within a particular time-limit. Differences in classification systems and the regularity with which lists of legally recognized diseases are revised determine the evaluation of the incidence and prevalence of certain diseases arising at work across the world.

The recognition of work-related diseases and general diseases affecting workers might also be subject to national legislation. There is, of course, always the legal option for individuals to have recourse in disputed cases (committees of experts, courts). However, the recognition of these two categories of diseases and revision of such lists would provide for the setting up of properly targeted and more effective prevention programmes.

The major diseases occurring in agricultural work include the following: infectious disorders such as those transmitted by contact with domestic or wild animals (zoonoses); respiratory tract infections; dermatosis; allergies; cancer; illnesses contacted by working in the open air; poisoning; musculoskeletal disorders arising from

Table 4.3. Number of occupational illnesses and incidence rates by type of illness in agriculture, United States, 1995

Occupational illness	Number of illnesses (10^3) (excluding farms with <11 employees)	Incidence rate/ 100,000 full-time workers
Disorders associated with repeated trauma	1.0	8.2
Skin diseases, disorders	2.5	20.3
Respiratory conditions due to toxic agents	0.2	1.4
Disorders due to physical agents	0.3	2
Poisoning	0.3	2.5
Dust diseases of the lungs	less than 50 cases	0.1
All other occupational diseases	1.1	8.8
All illnesses	5.4	43.5

Source: Bureau of Labour Statistics, United States Department of Labor, 1995.

Table 4.4. Occupational diseases in agriculture in France (whether or not incurring absence from work), 1996

Occupational diseases	Number of cases (1996)	Incidence rate per 100,000 workers
Peri-articular disorders	837	81.3
Allergic eczema	59	5.7
Respiratory allergies	61	5.9
Vibration and shock-related disorders	22	2.1
Leptospirosis	15	1.5
Brucellosis	22	2.1
Noise	22	2.1
Pesticides	22	2.1
Other occupational diseases	58	5.6
Total occupational diseases	1 118	

Source: MSA: *Données chiffrées. Le risque d'accident des salariés agricoles, 1976-1996* (Mutualité Sociale Agricole, Paris, 1997).

repetitive work, working in unsuitable positions, carrying heavy loads or working excessively long hours; and injuries due to noise and vibration. These diseases result in a significant expenditure of energy, premature ageing, absenteeism, declining productivity — and to high social and health costs at the national level.

The interaction among different risk factors to which agricultural workers are exposed must also be taken into account. A Ukrainian study carried out in 1994 showed a significant rise in mortality due to cardiovascular diseases among the rural population. In 1990 the death rate among persons aged 35-49 years was 425 per 100,000 in rural areas, compared with 348 per 100,000 in the same age-group in the cities. An assessment of the data showed that tractor drivers had the highest incidence of cardiac ischemia (8.4 per cent). This was attributed to the fact that they were exposed to vibration, noise, adverse micro-climates and excessive workloads. The same study showed that arterial hypertension was more frequent among workers who did not use machines. However, 30 per cent of this group had previously been tractor drivers. Furthermore, the study showed that exposure to pesticides over a ten-year period was associated with a twofold increase in the incidence of cardiac ischemia and a fourfold increase of arterial hypertension.[19] According to a recent survey carried out by the World Health Organization, the most serious health impairments in rural populations recorded in countries from Central and Eastern Europe and from the CIS were cancer, allergies and tuberculosis.[20]

The use of chemicals in agriculture

Nearly three-quarters of a million chemicals and chemical compounds are in use in agriculture throughout the world — and several thousand new ones appear on the scene every year. Many of these have harmful side-effects. They are introduced into the production process so quickly there is little time to assess their potential harm to workers.

In 1991 only 20 per cent of the world's pesticides were used in developing countries, yet they accounted for 99 per cent of the poisonings arising from their use.

The overwhelming majority of pesticides used in agriculture are synthesized chemicals. Their composition is complex. In addition to one or two active principles, they contain solvents, emulsifiers, tensio-active products, preservative agents, colouring, vomiting agents, etc. Their noxious effects are increased or activated when they interact with the human body, animals or the environment. These pesticides are usually classified according to the pests or organisms they are designed to kill. They include: insecticides (the most frequently used), herbicides, fungicides, nematocides, rodenticides, crow poisons, mole poisons, etc.

Table 4.5. Percentage growth in pesticide use by region between 1983 and 1993

Region	1983-88 (%)	1988-93 (%)
Africa	60	200
Latin America	45	40
Oriental Mediterranean	25	22
Extreme Orient	28	25
Other developing countries	15	12
All developing countries	37	55
World	23	20

Source: WHO/UNEP: *The public health impact of pesticides used in agriculture*, World Health Organization/United Nations Environment Programme (Geneva, 1990).

The routes of entry of pesticides in the human body are mainly through the respiratory tracts, cutaneous surfaces and the lining of the nose, mouth and eyes (mucous membrane). The respiratory tract is a channel for the absorption of contaminated airborne droplets into the lungs during breathing. The skin transmits these pesticides because they are dissolved in its own lipidic components, enabling them to penetrate the body's outer surface and reaching the underlying blood vessels. Any situation causing an increase in the respiratory rhythm or the permeability of cutaneous and mucous membrane increases the risk of pesticide penetration. Such situations arise as a result of heat, effort, inflammatory skin lesions such as eczema, allergic reactions, and skin abrasions. Failure to decontaminate the skin by washing after work prolongs the period of contact and increases pesticide penetration of the skin. The longer the period of exposure, the greater the dose of chemicals absorbed.

Intoxication by the digestive tract occurs less frequently; however, it cannot be entirely ruled out because of the lack of hygienic facilities during meals taken in the fields which lead to the contamination of food by contaminated hands and clothes. It is also not uncommon for workers to clean out the nozzles of spraying equipment by blowing through them. In rural areas pesticides containers are often used to store water and food — a practice which is another source of digestive poisoning for agricultural workers and may be attributed to a lack of information and advice.

The vast majority of pesticide intoxications diagnosed throughout the world bear evidence of acute poisoning. This may occur, for instance, when pesticides are applied in enclosed spaces such as silos and greenhouses where the chemical cannot disperse and occasionally attains high levels of concentration in the air. However, signs and symptoms of delayed toxicity, which are seldom diagnosed, are induced by repeated occupational exposure to low concentrations of pesticides. In these cases, there are no acute signs but rather chronic symptoms, which are frequently of a spurious and unrecognized cause. The chronic and delayed adverse repercussions on health include cancer, respiratory diseases, neurological and neuromuscular impairments, neurobehavioural effects, psychiatric sequels and allergies to a variety of chemicals. Teratogenesis is another form of chronic toxicity in foetuses of women exposed to chemicals during their pregnancy.

The way in which pesticides are applied has a very strong bearing on the degree of hazard. If workers carry spraying equipment on their backs, they are very close to the source of exposure. Changes in the wind direction during spraying may result in absorption by the respiratory tract, and leakages from joints in the equipment cause workers to come into direct skin contact with large amounts of pesticide. Spreading in unventilated or poorly ventilated spaces, such as greenhouses, expose workers to the inhalation and skin absorption of high concentrations of pesticides. The use of tractors during spraying creates high-density clouds of chemicals and if drivers are not in a closed cabin, they are drenched by the pesticide. Spraying from the air can expose pilots who are unprotected by closed cabins to chemicals and contaminate a large area; and this can create a risk for workers not involved in the operation, the population at large, food products left in the open and the environment as a whole. In some countries in Asia and Latin America children hold flags to guide planes as they fly over the fields to spray the crops.[21] In Egypt, 1.26 million workers each year are potentially at risk from aerial spraying, either because they work in the fields being treated, or because they are themselves spraying the pesticide.

In 1990, the WHO noted that at least three million persons were intoxicated by pesticides throughout the world every year and that 20,000 of them died. Chronic poisonings were not included in this data.[22] According to estimates made in 1994, there were 2 to 5 million annual occupational cases of poisoning, with 40,000 fatalities.[23] At the national level, exposure to pesticides continued to be one of the major occupational hazards, accounting in some countries for as much as 14 per cent of all occupational injuries in the agricultural sector and 10 per cent of all fatal injuries.[24] In France, more than 100,000 tonnes of pesticides were used — of which 40 per cent in vineyards — and about one million persons were potentially exposed.[25] The United States Environmental Protection Agency estimated at among 20,000 and 30,000 the annual number of cases of acute poisoning among American agricultural workers.[26] In the 1980-86 period, the National Social Security Institute of Costa Rica reported an annual pesticide poisoning rate for the total wage earning population of 5.3 per 1,000 workers — and 97 per cent of these occurred among young adults aged 20 to 29 years (23 per 1,000). About 60 per cent of all cases involved agricultural workers — and female agricultural workers showed a higher incidence rate than male workers in all age groups (25 per 1,000).[27]

Studies of pesticide exposure are numerous and generally indicate poor safety standards. Exposure to pesticides is also exacerbated by inadequate safety precautions in agricultural work, a lack of regulations controlling the sale of chemicals — particu-

larly by small-scale suppliers — and inadequate information provided to the workers and population using them. In small-scale farming, it is uncommon for farmers and workers to be aware of, or protect themselves against, major occupational hazards. The situation is not much better in large-scale farming.

According to a publication of 1996, the Factories Inspectorate in the United Republic of Tanzania estimated that 19,000 workers had been exposed to cotton dust, 14,200 to sisal dust and up to 10 million people to pesticides.[28] In 1991, the Zimbabwe Ministry of Health reported that approximately 10 per cent of the workforce were routinely involved in chemical spraying and that protective clothing was supplied in only about half of the farms surveyed.[29] Still in Zimbabwe, 30 to 50 per cent of workers in large-scale enterprises were directly involved in pesticide use. A survey of 30 enterprises producing fruit in South Africa revealed that 9 per cent of permanent employees worked directly in contact with pesticides (mixing, spraying, packing) and about 14 per cent of the seasonal workforce had indirect exposure to them when pruning or shaping vines.

In Zimbabwe, it was reported that workers harvested and sprayed pesticides without protective clothing. Field studies carried out in agricultural enterprises in this country during two distinct periods — 1985-86 and 1988-89 — showed that people working with pesticides (mainly mixing and/or spraying) were highly exposed. Controls for pesticide exposure were inadequate, given the level of toxicity of the product, and dissemination of information about the pesticides poor. In one survey, only one-third of sprayers claimed to have received any instructions and most workers only had a partial understanding of the pesticide labels or symptoms of pesticide poisoning.

An inspection of 39 formal sector farms and smallholdings in the Western Cape, South Africa, backed up by interviews, found that 56 per cent of sheds storing pesticides were unlocked and that 49 per cent contained equipment unrelated to pesticides such as tools, thereby needlessly putting other workers at risk. Only two of the farms enforced the use of personal protective clothing, though most had such protective equipment available. In Ethiopia, a study of 430 pest-control workers in three large enterprises revealed that they had little knowledge of the hazards involved in their work; indeed, 88 per cent of the workers were unaware of the risks inherent in the use of pesticides. Protective equipment was not available or inadequately used. In southern Africa, the few safety practices implemented tend to be directed towards the permanent workforce and not towards the largely female-dominated seasonal workforce. Casual or temporary workers often do not receive protective equipment or safety training and may thus be at higher risk than permanent workers. It has been noted that casual workers are less well organized in their work, applying pesticides by hand, while permanent workers have sole use of mechanical or backpack applicators.

While the focus of health and safety in agriculture must be on the working environment, account must also be taken of the fact that there is no sharp distinction between living and working conditions in agriculture. There have been reports of individual cases and epidemics caused by pesticide poisoning outside a work context. These have been attributed to the contamination of foodstuffs, during transport or storage; residues of pesticides in food; the presence of pesticides in water or food due to misuse of containers; and contamination of ground water with chemical wastes. Studies carried out in South Africa on large-scale farms revealed that pesticide containers were used for domestic purposes, thus contaminating food and water and exposing workers' families to chemical risks. Similar results were found in Zimbabwe, India, Sri Lanka and Pakistan.

Accidental exposure may also be of occupational origin. Workers not directly involved in spraying on commercial farms in Zimbabwe were exposed to organophosphate pesticides. A high proportion of poisoning cases in hospitals involved women and children. Of the 274 cases reported, 50 per cent were adult males, 30 per cent adult women and 20 per cent children under the age of 15 years. Workers living in agricultural enterprises near fields which have been sprayed are particularly exposed. In the Western Cape, South Africa, it was estimated that a quarter of farm workers lived in houses within 10 metres of recently sprayed fields or orchards.

Exposure to organochlorine pesticides in rural areas is a serious public health concern in Central and Eastern Europe. Breast milk contamination studies play a special role in the assessment of environmental exposure. A study carried out in Romania between 1994 and 1996, among 42 breastfeeding women, 150 young persons and 50 elderly people, found pesticide residues in the bodies of all persons participating in the study. Another study carried out in Ukraine from 1994 to 1997 showed that human exposure to organochlorine pesticides was inevitable among the Ukrainian population, irrespective of the region investigated, the age group and the occupation. The exposure of the newborn to organochlorine pesticides in the daily intake of breast milk frequently exceeded the FAO/WHO limits.

A number of other studies have revealed the hazards inherent in the use of common pesticides:

- organophosphorous insecticides have been implicated in the appearance of certain forms of blood cancer (chronic lymphoid leukaemia),[30] motor- and sensory neuropathology,[31] neuro-behavioural disorders and dermatological diseases caused by airborne transmission or direct contact;

Table 4.6. Incidence of cases of pesticide poisoning in some African countries

Country	Population (millions)	Economically active population in agriculture (% of total economically active population)	Annual incidence of pesticide poisoning
Sudan	24	80	384 000
Tanzania	23	85	368 000
Kenya	22	80	350 000
Uganda	17	80	272 000
Mozambique	15	70	240 000
Cameroon	11	80	175 000
Zimbabwe	10	80	160 000
Côte d'Ivoire	10	80	160 000
Malawi	8	85	128 000
Senegal	7	80	112 000
Mauritius	2	75	3 200

Source: A. W. Choudhry: "Health hazards of pesticide use in Africa", in *Proceedings of the East African Regional Symposium on Chemical Accidents and Occupational Health* (Institute of Occupational Health, Helsinki, 1989).

- methyl bromide is an anti-parasitic agent used against ringworm in horticultural production and causes acute respiratory deficiency, behavioural and other neurological disorders;[32]
- paraquat, an herbicide widely used in weed control and sprayed by knapsacks, mist-blowers (very small droplets) or plane, has been found to cause irreversible and fatal pulmonary fibrosis even when absorbed in minimal quantities (30/50 mg/kg of body weight). In Malaysia 10.7 per cent of cases of paraquat poisoning in 1987 had an occupational origin. A national survey of hospitalizations and autopsies carried out in Costa Rica between 1980 and 1986 showed that 60 per cent of work fatalities in agriculture were caused by this herbicide.[33] Similar cases have been reported in Sri Lanka, Indonesia and the Philippines. The chemical had penetrated the body through the skin surface during spraying or during work in areas which had been sprayed. In the other cases the contamination had occurred on account of contaminated hands, accidental spraying on the lips, oral pumping of the substance and accidental ingestion of the herbicide contained in drinking bottles.[34]

Zoonoses

Zoonoses constitute a serious public health problem, especially in developing countries, and include some of the most widespread and serious diseases in the world. In some cases they may even lead to partial or total occupational disability. Past experience indicates that they will play a growing role in the pattern of human morbidity in the future. Diseases derived from animals often pass unnoticed, either because animals themselves do not develop the illness or because there is a long interval before symptoms begin to appear in humans. Contamination may occur through direct hand contact with the animal or with substances derived from it — hair, meat, carcasses, bones, waste matter and the products of abortion or slaughter — and also by contact with contaminated environments. These illnesses can be extremely serious in humans, and their care costly. Treatment may often be complex, requiring prolonged periods in a hospital, as in the case of bovine tuberculosis, tetanus, and tularaemia.[35] Some of those diseases need surgical treatment — an example being hydatidosis[36] — as well as intensive post-surgical operation care on account of the sensitive organs affected, such as lungs, the liver, and the central nervous system. Other diseases are highly contagious and can lead to epidemics — including malaria, brucellosis (undulant fever), salmonellosis[37] or Newcastle virus disease;[38] even if the treatment of these diseases is relatively straightforward, the social cost of such epidemics is very high. Listerioses[39] are the cause of miscarriages or, if contracted at an advanced stage of pregnancy, of serious congenital defects. Finally there are some tragic diseases, such as rabies. In France, 75 per cent of recognized occupational diseases in agriculture are infectious or parasite-borne.

Other infectious and parasitic diseases

Parasitic diseases present in the workplace have a variety of causes; the ingestion of parasitic eggs (for example, hydatidosis, amoebiases[40]) as a result of contamination of food or hands through dirty tools or from animals and animal derivatives is one source. Certain larvae present in the soil in hot and humid areas (with a temperature

above 20 °C) can enter the body through exposed healthy skin and the lining of the nose, mouth and conjunctiva (such as haemorrhagic fever,[41] filariasis and bilharziasis[42]) when working in rice fields, mushroom areas and other terrains infested with these parasites. The risk of such contamination is increased in areas of high temperature by the problems posed in wearing protective clothing and boots which may themselves increase body temperature and provoke excessive perspiration. Several parasites can penetrate into the bodies of workers through biological vectors, as is the case of insects carrying malaria, leishmaniasis and sleeping sickness.

Others infectious diseases which can be contracted in the agricultural working environment have a serious prognosis. Tetanus, rabies, typhus, Q fever and Lyme disease (a tick-borne disease) are telling examples.

Three epidemiological aspects of infectious and parasitic diseases must be pointed out:

(1) Mobile populations from heavily infested regions, which are infected or carrying infected vectors, move to other regions where infestation is low or non-existent; however, diseases such as bilharziasis, trypanosomiasis, leishmaniasis and brucellosis, find a favourable environment and are particularly difficult to control.

(2) New areas of endemic infection are appearing as a result of a recrudescence of certain diseases, as is the case of malaria in Brazilian Amazonia. The felling of trees to increase agricultural land and build access roads in the tropical forest has contributed to the emergence of foci — resulting in the breeding of vector mosquitoes and causing a significant increase in cases of malaria. This policy has led to the destruction of vast stretches of forest as well as to an increase in national public health costs.

(3) Changes in agricultural techniques may bring new human epidemics in their wake. A prime example of this has been the use of ground animal products as a complement to cattle feed. The failure to eliminate greases contained in meat and bones originating in sheep infected with, but no showing signs of, scrapie (another transmissible spongiform form of encephalopathy) has led to the contamination of cattle by a non-conventional (i.e. neither bacterial nor viral) infectious agent, giving rise to an epidemic of bovine spongiform encephalopathy (BSE). Some 160,000 cases have been recorded since 1986, principally in the United Kingdom. During the same period, cases of the atypical human form of BSE, resembling Creuzfeldt-Jacob's disease, have been found in the general population to a greater than usual extent (one case per million). An irrefutable link has yet to be established between the human form and occupational activity, but the possibility of contamination through the contact with cattle derivatives cannot be completely excluded.[43]

Dermatological diseases

Skin disorders can result from the entry of pathogenic agents into the body, either through a lesion (a bite, a scratch, a sting), as in the case of leishmaniasis, septic infection (anthrax) or erysipelas disease, or through a healthy skin surface as in the case of charcoal bacteria or tularaemia agent. Fungal infections may be directly contracted from infected animals (tinea) or developed in areas of skin maceration (candidiasis and others). This maceration results from humidity and heat, contact with sugar from fruit

and excessive perspiration due to the use of waterproof clothing (such as rubber boots and gloves). The lesions created are often difficult to treat, take long to cure and are contagious.

Other agents cause acute, subacute or chronic dermatosis. They are not always easy to identify and, in many cases, interactions and synergism among different agents make a diagnosis difficult. Secondary bacterial infection often masks the original cause. In the long run the skin around the affected area becomes thick and wrinkled, because it has been opened by numerous fissures which become secondarily infected and very painful, impeding or even completely preventing the affected person from undertaking manual work. Contact dermatitis is the most common occupational dermatological infection in agriculture and is caused by the action of solvents and other products present in pesticides and in certain vegetables. Eczema, or allergic dermatitis, can be caused by numerous flowers produced in ornamental floriculture (such as primula, tulips, freesia, mimosa, geraniums, daisies); by chrome contained in rubber boots or gloves; by veterinary antibiotics; by pesticides (fungicides of the dithiocarbamates group) and by disinfectants and soaps. These plants and products produce lesions through local and occasionally airborne contact. Occupational acne is acquired from the handling of motor oil and grease or the moving parts of agricultural machines. It should be pointed out that, besides their specific effects, certain photosensitive substances, such as mineral oils and greases and antibiotics, can produce acute inflammatory cutaneous lesions when exposed to the sun.

Respiratory diseases

Respiratory disorders in agriculture cover a wide range of clinical manifestations, from benign disorders to serious respiratory insufficiency. Common germs can, in conditions of cold and damp, cause rhinitis, or infectious tracheitis or bronchitis, which may recur and become chronic; these symptoms may, in turn, give rise to serious respiratory deficiencies and possible complications such as chronic bronchitis, pneumonia, emphysema, dilation of the bronchi or cardiac insufficiency. Asthmatic responses to vegetable fibres (such as chrysanthemums, sunflowers, henna), as well as to acarians and other insects, have similar consequences and can lead to occupational asthma. The various organic allergens can, furthermore, be carriers of bacteria, moulds, toxins and pesticides and transport them into the respiratory tract, thus creating even more serious lung difficulties. Working in closed spaces such as glasshouses and silos can expose workers to high concentrations of allergenic dusts.

The inhalation of vegetable dust occurs principally at harvest time. However, clinical syndromes hitherto observed only among workers in manufacturing are appearing with increasing frequency in agriculture; this has been attributed to the tendency of carrying out the first stage of processing in agricultural enterprises. The most frequent cases involve dust produced by coffee, tea, cotton, cinnamon, cashew nuts and cereals. Occupational asthma in tea processing has been diagnosed in Sri Lanka and in Canada. Sri Lanka has also reported cases of asthma related to the processing of cereals and cinnamon.

Dusts containing fungi, thermophilic micro-organisms or certain vegetable dusts (such as bagasse, mouldy straw, paprika or coffee dust) have caused extrinsic allergic alveolitis which can develop into fibrosis of the lung tissue and cardiac insufficiency.

Gases used as pesticides or produced by a reaction when pesticides are applied — including hydrogen sulphide, phosgene and, chlorine — affect directly, through irritation, the walls of the respiratory tract, bringing with them the possibility of asthmatic reactions among people suffering from bronchial hyperactivity.

Climatic conditions

Work in the open exposes workers to wind, rain, cold, heat and ultraviolet radiation. These agents can lead to a series of health problems which, even if they cannot strictly be classified as occupational health problems, cause absenteeism, low productivity, and a lowering of the organism's resistance to well-known disorders. Rain and cold can lead to respiratory infections and chilblains which leave skin lesions liable to become infected. Exposure to the sun may cause burning, chronic photodermatosis (diffuse redness on the exposed parts of the skin, associated with cutaneous atrophy which may lead to localized thickenings after several years) and varying degrees of sunstroke. Heat causes a dilation of superficial blood vessels and thus leads to dehydration through over-perspiration (sometimes rendered more severe by excessively protective and waterproof clothing), as well as leg oedemas, cramps and fainting; it also facilitates poisoning through cutaneous absorption and the spread of pesticides inside the organism. The wind carries bacteria, parasites, mineral and vegetable dust and fungal spores.

In developing countries, the negative effects of long hours of work may be exacerbated by the effect of extreme climatic conditions. Malnutrition, hot and humid weather and endemic diseases may also undermine the capabilities and performance of agricultural workers. Studies on the effect of heat exposure on workers' health have shown that temperatures that differ — even minimally — from the comfort zone, tend to increase the risk of accidents.

In large agro-industries work schedules try to take advantage of maximum shifts allowed in a temperate climate. No account is taken of heat stress when planning working time. In small farms which practise self-sustainable agriculture workers tend to carry out heavy work in the early hours and before noon, and sedentary work in the afternoon. This is in keeping with the traditions of rural life which are adjusted to the hot climate. Workers seldom work more than half a day of heavy work.

Occupational cancer

Occupational cancer in agriculture can present as a delayed complication of certain diseases of occupational origin, or it can arise through direct exposure to a variety of risk factors. A study carried out in northern Italy between 1957 and 1992 in a region where rice production accounts for between 80 per cent and 85 per cent of agricultural activity, and where herbicides have been used since 1950, revealed the presence of a type of blood cancer (non-Hodgkin's lymphoma) among workers handling phenoxyacetic herbicides.[44]

Chronic photodermatosis resulting from short-wave ultra-violet rays can degenerate into skin cancer. Malignant melanoma is more dangerous than certain skin cancers, but it is rare. It can present as a secondary disorder following exposure to ultra-violet

rays, but it has been found more frequently in cases of simultaneous exposure to pesticides (dibromo-chloro-propane).

Numerous biological agents have been implicated in the development of cancer in humans and some of them are closely related to working conditions in agriculture. Urinary bilharziasis, contracted through work in flooded areas in North Africa, sub-Saharan Africa and the Arabian Peninsula, is a cause of cancer of the bladder, while the intestinal form which arises in Indonesia, China and the Philippines, leads to hepatic, oesophageal, gastric and colorectal tumours. Facioliasis induces cancer of the bile ducts among cattle workers who are in contact with surface waters — lakes, water-channels and swamps — contaminated by flukes from the stools of infected cattle, goats and sheep. Such cases have been reported in the north-east of Thailand and the Lao People's Democratic Republic.[45]

Pesticides and fertilizers have been associated with the appearance of gastric and bronchial cancers (e.g. arsenical fungicides), as well as to non-Hodgkin's lymphomas (phenoxy-acetic herbicides).

The issue of post-traumatic cancer is still open. Much statistical information shows that this type of disease tends to appear early, erupting on the skin in the months immediately following an injury. Some observations have been made of post-traumatic cancer of the breast, testicles and bone. It is thought that they are linked to mechanical micro-traumatisms at work, such as the handling of a tool or the repeated rubbing of an object against the skin.

Lifting and carrying of loads and musculoskeletal disorders

Carrying of heavy loads can cause serious musculoskeletal disorders, such as chronic back pain, chest pain and miscarriages. The efficiency and economy of physical effort in ergonomics can address the problems of load carrying by assessing workers' transport strategies and providing simple solutions. Given that some countries have no legislation stipulating the maximum weight to be carried by a worker, one possible approach is to train workers on the correct procedures for lifting and carrying to avoid risk of injury or accident.[46]

The adoption of awkward and uncomfortable postures and carrying of excessive loads causes numerous but largely unreported musculoskeletal disorders in agriculture. Traditional tools and methods require high human energy input. Back injuries and low back pain are mainly associated with heavy physical work and repeated lifting and twisting. Knee lesions often appear when work involves kneeling and walking on uneven surfaces.

In agriculture, a number of operations originally designed to be carried out in a sitting position are actually performed standing. Seats are usually uncomfortable either due to poor design or to damage caused by misuse or age. Bench heights for manual work should be related to the manual work being carried out and the elbow height of the worker. If this is not the case, excessive strain is placed on the worker and the ensuing fatigue may increase the possibility of an accident.[47]

Carrying loads is one of the major chores of rural women workers in developing countries. They can spend over 20 hours a week on trips collecting water, firewood, laundry and livestock, tending and marketing goods and carrying weights of more that 35 kg in their heads and backs over considerable distances. In view of the fact that

women often have a double role as worker and housewife, attempts should focus on improving their working capital and living conditions.

Neurological problems arise from repeated pressures on tools with the hand. The sciatic nerve is placed under strain as a result of prolonged bending over and carrying heavy loads. Furthermore, changes in production processes and the increase in the pace of work have brought to the fore new occupational pathologies such as tenosynovitis among cane-cutters and workers pruning tea-bushes. Chronic musculoskeletal disorders are the type of injuries that are very likely to develop cumulatively in time and most of them can lead to permanent disability.

Noise and vibration

Low frequency but high amplitude vibrations which affect the driver's seat and cabin in tractors and other agricultural machines, combined with poor posture and ergonomically unsuitable design, lead to spinal, gastro-intestinal and urinary tract problems. The relative movements of the head and the environment produced by the vibrations reduce the visual accuracy of the drivers can cause them to makes mistakes.

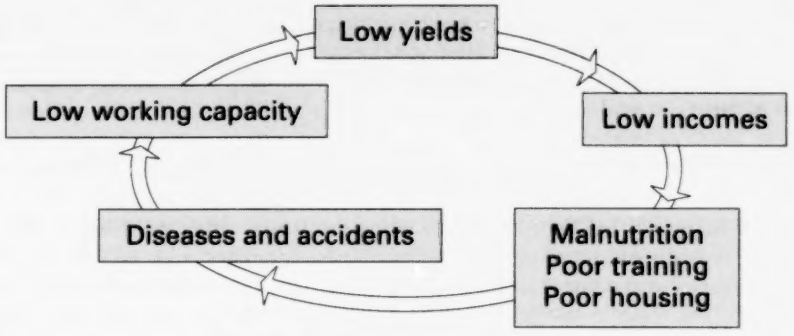
Noise in agriculture is the result of high frequency vibrations produced by machines. When it is at full power, the engine produces far more than the 85 dB(A) established as the limit for the prevention of hearing loss. The usual level is 95 and even 100 dB(A) for long periods, both in tractors without cabins and those with cabins — in which there is additional resonance phenomena. The effects of noise are auditive and extra-auditive. Auditive effects bring about reduced awareness of other simultaneous noises (for example cries warning of danger), auditive fatigue when a worker temporarily presents a higher hearing threshold, and occupational deafness. Extra-auditive effects appear after several hours of exposure and consist of irritability and psychological stress. In addition to these factors, agricultural machine drivers might find their speed of reaction in psychomotor tasks reduced, especially when they have to monitor several different elements simultaneously. This occurs, for instance, when they have to adapt the machine trajectory to the irregularity of the ground, during specific operations with tractors and trailers, when they carry out operations jointly with other workers.

Relation between general diseases and work-related diseases

The interaction between poor living and working conditions determines a distinctive morbidity-mortality pattern among agricultural workers. Such a pattern is due to the combination of malnutrition, general diseases present among the rural population (such as malaria, tuberculosis, bilharziasis, gastrointestinal disorders, fluorine intoxication, endemic goitre, anaemic deficiencies, drepanocytosis, etc.), occupational disorders and complications arising from undiagnosed or untreated diseases.

Working capacity is closely related to workers' malnutrition and poor health. Despite the fact that certain developing countries have reached higher levels of economic development, nutrition and health are still problem areas; the situation is a vicious circle of low productivity, low wages, malnutrition, diseases and low working capacity. This is particularly evident in the agricultural sector because a great deal of the work in this sector is manual or semi-mechanized and closely related to working

Figure 4.1. The economic cycle of disease



Source: "Teaching ergonomics and occupational safety and health in tropical agriculture and forestry" (National Board of Occupational Safety and Health, Stockholm, 1982).

capacity. In addition, general diseases affect working ability and further decrease working capacity when associated with other occupational-related conditions such as heat stress. Working capacity (maximal aerobic capacity) is reduced in proportion to body size but sustained working capacity is decreased further by the effects of disease and malnutrition.[48] Agricultural workers are obliged to expend considerable energy and do not have the opportunity to recuperate; as a result, their life expectancy is reduced compared with other workers.

In Cameroon, there has been a re-emergence of pulmonary tuberculosis among agricultural workers during the 1990s. Between 1991 and 1994, four health centres in agricultural areas reported 81 per cent of all cases registered, with an incidence rate of 1,240 cases per 100,000 workers. The main factors responsible for this state of affairs have been attributed to inadequate housing conditions, poor working conditions, the multiple resistance to vaccinations and the increase in HIV infection.[49]

Poor living conditions on large-scale farms have also exacerbated the increase in malaria. In Swaziland, the incidence of malaria was significantly reduced during the 1950s. However, the development of large citrus and sugar enterprises was accompanied by the building of irrigation canals — and relatively little attention was paid to the workers' living conditions. Unable to attract sufficient Swazis to work on these enterprises, the owners recruited workers from Mozambique, where malaria control was weak, ignoring warnings issued to them by health officials. The presence of thousands of migrant Mozambican workers helped to increase the number of malaria cases in the country, while the poor environmental conditions further contributed towards the spread of the disease.

Combined environmental exposures can also have an increased impact on workers' health. In Ukraine, many farmers are living in areas contaminated by radiation after the Chernobyl disaster. Since 1986, extensive studies have been carried out on the synergetic effect of exposure to radiations and chemicals in agriculture and their genetic effects associated with low and high doses of pesticides and ionizing radiation. It has also been observed in Ukraine that agricultural machine operators in contaminated areas have a reduced immune system capacity to react to pathogenic organisms. Even though the workers studied did not belong to groups traditionally at risk, their immunological response was reduced as compared with children in their first years of life. Those findings were explained by the combined exposure to organochlorine pesticides and heavy metals found in the contaminated soil such as lead, cadmium and manganese.

HEALTH CARE SERVICES IN THE RURAL SECTOR

Occupational safety and health management in agriculture is generally more complex than in industry. It not only involves Ministries of Labour and Health but also Ministries of Agriculture and the Environment. These institutions are responsible for labour relations, both individual and collective; employment and training; health; safety; workers' welfare; working conditions (including women's work, child labour, working time, wages and payment systems); and the technical aspects of agricultural production.

The sector requires the expertise of a significant number of specialists, including labour inspectors, safety and health inspectors, occupational medicine inspectors, specialists in social security and insurance experts, occupational and rural health specialists, safety engineers and technicians, public health officials, trainers, agronomists and agricultural extension workers. These specialists often work independently, and their tasks overlap to a certain extent. There is frequently a lack of comprehensive programmes, cooperation between institutions and harmonization of the various interventions; it is also rare to find any follow-up and overall evaluation of the activities carried out and of their impact.

All these shortcomings are compounded by problems of distance, geographical dispersion, poverty, cultural differences and difficulties of access to the various services. Housing is frequently unsanitary and located far from medical centres, and health care is insufficient and unsuited to agricultural workers' needs.

There is an overlapping of legal responsibilities among institutions and bodies. Furthermore, the commitment of these institutions to work in agriculture is subordinated to national priorities which are not necessarily part of a national policy for the sector. This is further complicated by an approach which places an emphasis on an urban industrial model of intervention in health and safety matters. In response to legal requirements, quantitative monitoring has overtaken qualitative methods of assessment. Indeed, quantitative monitoring is based on an industrial approach which is geared to systematic work processes and focuses on specific work areas in enclosed spaces; it makes reference to threshold limits which have frequently been established by outdated measuring instruments and statistical analysis. Agriculture, however, has few activities which are suitable for such an approach — and that is why until today it is known as a "difficult" sector.

In many cases, government officials either know little about rural conditions or do not have adequate means to carry out their duties. The intervention of urban-based inspectors, health professionals and programme designers do little to help the situation. Some countries have national or governmental committees or councils or tripartite bodies — with representatives of the government, employers and workers who are responsible for inter-institutional coordination of safety and health; however, only rarely is there a committee dealing with the agricultural sector. Government officials and regional leaders are frequently unaware of the problem.

In developing countries, the increasing number of temporary and migrant workers during harvesting periods, changes in diagnostic procedures, or the appearance of new illnesses may be further causes of notable variations in the number of cases reported. Consequently, the results of preventive measures taken against occupational diseases and accidents in agriculture in the various countries can only be evaluated in the light of national law and practice. Continuous monitoring of workplace procedures allows for primary prevention of occupational diseases and accidents. Anomalies and occasional incidents which reflect defects in the risk-management system at the primary prevention level are the basic elements in programmes of secondary prevention (correction after the occurrence of an incident, prevention of further cases and of recidivism, treatment of individuals) and tertiary prevention (prevention of further complications).

In a number of industrialized countries agricultural wage-workers and producers have voluntarily organized themselves in associations which provide the best coverage and services. One example of comprehensive health care coverage in agriculture is given by France which is one of the leading agricultural producers in the European Union with 7.5 per cent of its total labour force engaged in agriculture. Since 1973 this country has established a mutual agricultural benefit society — Mutualité Sociale Agricole (MSA) — funded and managed under a tripartite arrangement by the State, the farmers/employers and agricultural workers. Because all groups participate in a single body, the MSA has succeeded in achieving a high level of coverage — up to 98 per cent of farmers and agricultural workers. It has also helped towards improving knowledge of working conditions in the agricultural sector and conducted research on improved preventive measures in the sector. In 1993, almost 270 occupational health physicians and 340 other professionals provided back-up for MSA members in their programmes of chemical surveillance, stress prevention, back pains, deafness, musculoskeletal disorders, workplace accidents, disablement, respiratory problems — in addition to the routine service provided. Regional committees of doctors and consultants bring these services within reach of the workers and farmers, contributing further to raising awareness, information and training. On the basis of technical studies, the MSA is also involved in the conception and design of materials and equipment and in the drafting of new safety standards for machines.[50] The medical labour inspectorate is placed under the authority of the Ministry of Agriculture. Despite these elaborate arrangements, farmers still employ undeclared temporary workers at peak periods during harvesting and because of the high cost of social contributions. Part of this undeclared labour force is composed of migrants workers who are specialized in production techniques and agricultural machinery.

The best models of health care coverage for agricultural workers are found in Finland and Sweden. Farming is a very small-scale industry in Sweden and consists mainly of family-run farms. Eighty-five per cent of wage-workers in Sweden are

covered by the occupational health scheme, whereas the remaining 15 per cent are employed in small enterprises and join on a voluntary basis — which is the case of most farmers. At the heart of the occupational health system is the local occupational health centre. These centres are located in farm areas and organized in such a way that each centre provides services to between 1,000 and 2,000 farmers. The system has always been extremely centralized despite the fact that the country is divided into six service regions with a regional officer responsible for the provision of services to farmers in that region. However, this well developed and comprehensive programme started to decentralize its management in 1995. With this new policy, emphasis is being placed on changes in working conditions and workers' attitudes towards occupational health and safety, because it is considered that it is not enough merely to provide farmers with health check-ups and specialized health care or to undertake scientific investigations to identify health problems and hazards.

In developing countries, the organization of occupational health care for agricultural workers generally takes two distinct forms: large farms — plantations, large cooperative or government farms — and peasant farming. Large farms usually have organized labour managements responsible for health care. It is not uncommon to find large agricultural enterprises (above all multinationals) in developing countries provide not only occupational health services but also general health care. In some cases, they have general medical and maternity units, pharmacies and standard laboratory facilities, and even, at times, a few hospital beds and dental care. Workers' families are also cared for under this system. Occupational health services remain limited to periodic visits — often at excessively lengthy intervals — and sometimes provide vaccinations and deal with other general health care aspects. Occupational diseases are taken care of within the framework of ordinary diseases — and even if accidents are recorded, they are rarely studied with a view to drawing up prevention programmes. Examples of these kinds of services may be found in Costa Rica, Panama, Argentina, Chile, Mexico, Côte d'Ivoire and other countries. The small-scale peasants who account for the largest share of agricultural workers in many developing countries in Asia and Africa do not, however, benefit from any occupational health and safety services — or often from any public rural health services at all.

However, there are examples which demonstrate the feasibility of occupational risk-prevention programmes in agriculture geared towards self-employed farmers. For instance, in Botswana, the Occupational Health Unit in the Ministry of Health planned a system to look after remote rural areas. "Community health workers" were chosen from among agricultural workers and trained to recognize and prevent health problems and provide emergency treatment. Their tasks were also to promote and disseminate the basic principles of occupational safety and health and general health and their relationship with agricultural work and health generally and to provide training to other health promoters in their region.

Training and information in health and safety at work in agriculture

Most industrialized countries provide specialized training on occupational health services in agriculture through their extension services, farmers' associations and other relevant institutions. Nowadays, in many developing countries, training in occupational health and safety, especially in agriculture, is not considered a priority because

people know little about its benefits. Few are aware of the important role it plays in promoting workers' health, cutting the social and health costs of sickness and accidents, increasing productivity, contributing towards the social stability of the country concerned and protecting the environment. These considerations take second place to the implications of the cost of organizing the sector, reallocating human and material resources and providing assistance to small and medium-sized enterprises.

Formal studies have shown that the basic level of education, especially primary education, is an important factor in the subsequent development of the individual and society. Investment in education and human resources leads to qualifications which increase efficiency, help to spread available techniques and stimulate technological innovation. Training in health and safety in agriculture requires a pragmatic approach in order to achieve a sound understanding of the sector and dispel any misconceptions about the inevitability of accidents. If intervention is to be effective in analysing and preventing risks, it must be backed up by knowledge and information.[51]

This training must provide those involved in agriculture with:

- a sound knowledge of work processes and procedures in production;
- the means to identify, assess and monitor work-related risk factors;
- ways to ensure health surveillance of workers before, during and after work;
- information on first aid;
- methodologies for planning and implementing risk prevention and safety and health promotion programmes.

Advice and assistance to small-scale farmers is limited. However, there are a number of successful examples of projects undertaken with farmers' associations. An ILO project on the promotion of health and safety at work in agriculture in Central America (1993-98) developed activities with farmers' associations and cooperatives to introduce alternative methods of pest control and organic agriculture in order to reduce the intensive use of pesticides and fertilizers. These activities were conducted in collaboration with national non-governmental organizations and extension services and dealt both with the safety and health of workers and their families and the protection of the environment. The communities involved were situated far from urban centres and access to them was difficult. The inhabitants of these communities were extremely poor, suffered from nutritional deficiencies, lacked a basic education and worked on poor and eroded land. The project provided training combined with practical activities concerning the organization of work and production procedures. In addition to training in health and environmental protection, the farmers were also taught how to build terraces and drainage systems, produce and use organic fertilizers and grow vegetables to provide a balanced diet. They also received instruction in seed production, pest management, the production of organic pesticides, and breeding of fish poultry and pigs to improve their income. An evaluation of this project in 1996 showed that in Panama alone, the participation of 1,100 farmers had potentially benefited a total of 4,500 persons in the region.

Organic farming techniques have demonstrated that production costs can be cut by reducing or suppressing the use of pesticides. In Canada, about 25 per cent of the total precipitation in the prairies falls as snow, but winds in winter tend to sweep the snow off the bare fields into ditches and depressions in the landscape. Since the 1980s in certain regions, the stubble from the previous crop and the leguminous plants scraps has been used to protect the soil against dryness during winter. These products, which are deposited in strata, trap the snow and put moisture back into the soil in the spring.

This system has generated over twice the net income of the cropping system using the same rate of fertilizer. Another example is the use of the green manure legumes to enrich the ground with organic matter, reduce erosion during fallow periods and increase nitrogen in the soil. Moreover, this process upgrades the soil levels in nitrate and organic matters, while crop rotation attenuates the incidence of diseases in cereals and improves yields of cereals following legumes in the rotation.

Repercussions of agricultural production processes on the environment

Environmental pollution caused by the inadequate selection and excessive use of agrochemicals can have widespread negative repercussions, such as the destruction of biological species and changes in the natural biological balance. Unfortunately, this may be the result of methods adopted by some large corporations which are mainly concerned with gearing their production to export to meet the standards of international markets rather than adopting a sustainable approach to agricultural development.

The methods used in these cases involve intensive and extensive monoculture which reduces the variety of vegetable species over a large area and makes a selective destruction of local pests. The reduction of the variety of flora and fauna breaks the cycle of in-built pest control and leads to the need for increased chemical controls. However, the commercial pesticides remove the most vulnerable pests, leaving behind the resistant ones. Therefore, a treadmill effect is set in motion requiring ever more harmful pesticides leading to renewed secondary effects.

Another consequence of intensive agriculture is that it exhausts the specific elements present in the soil which are necessary for crop cultivation. As the soil becomes less fertile, it requires more regular and concentrated doses of chemicals such as fertilizers to develop the crops. A vicious circle takes hold, increasing both production costs and the costs of maintaining agricultural workers in good health.

Furthermore, extensive agriculture causes changes in the geographical relief and in river-beds. It destroys vegetable plants whose deep and abundant roots sustain the soil, thus allowing the wind and the heat to erode the soil and dry it out. As a result rainwater washes away the topsoil, leading to its further impoverishment and causing flooding through land drift and the destruction of river banks.

Various incidents have been reported across the world of mass extinction of shrimps, fish and crustaceans as a result of the contamination of rivers during airborne spraying, and the use of rivers to wash out fumigation tanks and application equipment in rivers. The same can be said of domestic fauna: bees, cattle and aquatic animals in breeding ponds. The resulting economic losses can be extremely serious, as in the case of the destruction of 300 beehives in Filadelfia, Costa Rica, in 1986.[52] Small and medium-sized farmers are receptive to commercial advertising and to production models which rural banks consider worth financing. Although they are not responsible for environmental disasters, they also contaminate the environment by frequently using unsuitable methods of application and waste management.

It is relevant to recall that organochloride pesticides — DDT, aldrin, etc. — are extremely stable compounds and, even if many countries have now prohibited them, they can remain in the soil for thirty years and more. They are gradually absorbed by crops and accumulate there before the contamination moves along the entire food chain finally reaching the consumer.

During the 1980s, a study was carried out on the effects of organochlorine pesticides on the agro-ecosystem and the food chain in Algeria, Egypt, Ghana, Nigeria, United Republic of Tanzania, Uganda, Zambia and Zimbabwe. The study found that organochlorine residues were high in fish as a whole and that there was a scarcity of fish in water sources close to the areas of application of these pesticides. Birds examined in the United Republic of Tanzania and Egypt revealed degenerative changes in the liver, kidney and nerve tissue.[53] Surveys of organochlorine pesticides residues (such as DDT) used in agriculture and tsetse-control spraying in inland waters of Zimbabwe found similar results.

Studies conducted in 1996 in the regions of Lublin and Zamosc in Poland on the contamination of drinking water and soil with agrochemicals detected the following compounds in water sources: lindane, DDT, methoxychlor, fenitrothion, atrazine, sinarzine, alphamethrin and deltamethrin.

The use of synthetic fertilizers containing nitrates contaminates the soil and results in particularly high concentrations of nitrates in groundwater. Other sources of contamination include animal manures, human wastes, nitrogen-fixing bacteria and plants and other geological sources; however, synthetic fertilizers are the most responsible for contamination. Nitrates in drinking water and food have important health implications such as haemoglobin disorders in infants which can provoke occasional mortality (blue baby syndrome), as well as chronic effects including blood cancer (non-Hodgkin's lymphoma), stomach cancer, and in some instances birth defects.

Notes

[1] M. S. Kaminaka, E. A. Eglie: "Lever controls on specialized farm equipment: Some control/response stereotypes", in *Applied Ergonomics* (Oxford, 1985), Vol. 16, No. 3.

[2] V. Forastieri: *Ergonomic problems in agriculture in developing countries*, to be published in electronic form on <<www.ilo.org/public/english/90 travai/sechyg/>>(ILO).

[3] M. S. Kaminaka: "Research needs in the American agricultural equipment industry", in *Applied Ergonomics* (Oxford, 1985), Vol. 16, No. 3.

[4] ILO: *Yearbook of Labour Statistics*, 1996, op. cit.

[5] J. C. Bastide: "Près de 5 millions d'accidents du travail", in *Travail & Sécurité* (Paris, 1998), No. 574-575.

[6] National Safety Council: *Accidents facts* (Itasca, IL, 1997).

[7] D. H. Cordes, D. Foster Rea: "Preventive measures in agricultural settings", in *Occupational Medicine: State of the Art Reviews* (Philadelphia, Hanley and Belfus Inc., 1991), Vol. 6, No. 3.

[8] M. D. Schulman, C. T. Evensen and C. W. Runyan: "Farm is dangerous for teens: Agricultural hazards and injuries among North Carolina teens", in *Journal of Rural Health* (Kansas City, MO, 1997), Vol. 13, No. 4.

[9] See: Mutualité Sociale Agricole (MSA): *Données chiffrées. Le risque d'accident des salariés agricoles, 1976-96* (Paris, 1997).

[10] H. Phoolchund: "Health and safety in agriculture: The sugar cane industry", in *African newsletter on occupational safety and health* (Helsinki, 1991), Vol. 1, No. 3.

[11] E. A. Schuman, R. A. Muñoz: "Accident occurrence and control among sugar cane workers", in *Journal of Occupational Medicine*, No. 9, 1986.

[12] MSA: *Prévention des risques professionnels des salariés agricoles. Des conseillers au service des entreprises* (Paris, 1994).

[13] L. Marquez Delgado: "Seguridad en la maquinaria agrícola", in *Salud y Trabajo* (Madrid, 1986), No. 56.

[14] T. Driscoll: "Tractors and fatalities", in *Worksafe News* (Australia, 1998).

[15] Phoolchund, op. cit.

[16] Schulman, et. al., op. cit.

[17] Höglund: "Agriculture", in *The workplace*, op. cit.

[18] F. Piccot: "Silos", in L. Parmeggiani (ed.): *Encyclopaedia of Occupational Health and Safety* (ILO, Geneva, 1983), Vol. 2, third (revised) edition.

[19] Y. I. Kundiev: "Occupational and environmental health policy. Actual medical and ergonomic problems in agriculture in the Ukraine", in *International Journal of Occupational Medicine and Environmental Health* (Lodz, Poland, 1994), Vol. 7, No. 1.

[20] A. Kuchak: *Priority issues in environment health and safety in agriculture in the WHO European Region at the beginning of the XXI century. Perception of member States*, paper submitted to the International Conference on Environmental Health and Safety in Agriculture on the Boundary of Two Millennia, Kiev, Ukraine, September 1998 (WHO, European Centre for Environment and Health).

[21] Forastieri: *Children at work*, op. cit.

[22] WHO/UNEP: *The public health impact of pesticides used in agriculture* (Geneva, 1990).

[23] ILO: "Chemicals in the working environment", in *World Labour Report 1994* (Geneva, 1994).

[24] ILO: *Wage workers in agriculture*, op. cit.

[25] F. Testud: *Pathologie toxique en milieu de travail* (Editions Alexandre Lacassagne, Lyon, 1993).

[26] ILO: *Wage workers in agriculture*, op. cit.

[27] Forastieri: *Information note on occupational health and safety in agriculture*, op. cit.

[28] L. Kitunga: "Prevalence of occupational disease in Tanzania", in *African Newsletter on Occupational Health and Safety* (Helsinki, 1996).

[29] C. McIvor: *Zimbabwe, the struggle for health: A community approach for farm workers* (Catholic Institute for International Relations, London, 1995).

[30] J. Clavel et al.: "Farming, pesticide use and hairy-cell leukaemia", in *Scandinavian Journal of Work and Environmental Health* (Helsinki, 1996), No. 22.

[31] J. R. Beach et. al.: "Abnormalities on neurological examination among sheep farmers exposed to organophosphorous pesticides", in *Occupational and Environmental Medicine* (Birmingham, 1996), No. 53.

[32] Testud, op. cit.

[33] C. Wesseling, L. Castillo, C-G. Elinder: "Pesticides poisoning in Costa Rica", in *Scandinavian Journal of Work, Environment and Health* (Helsinki), 1993, Vol. 19, No. 4.

[34] C. Wesseling et. al.: "Unintentional fatal paraquat poisonings among agricultural workers in Costa Rica: Report of 15 cases", in *American Journal of Industrial Medicine* (New York, 1997), No. 32.

[35] Bacterial disease transmitted by rabbits.

[36] Parasitises contracted from dogs contaminated by the sheep and camels viscera, and due to the development of larval cysts.

[37] Infectious diarrhea causing dehydratation in children and older persons.

[38] Human viral encephalitis transmitted by birds.

[39] Bacterial disease transmitted by sheep and goats.

[40] Bacterial disease reaching the liver and transmitted by contaminated water or food.

[41] Haemorrhagic fever or leptospirosis is a bacterial disease caused by water contaminated by rat urine, in livestock areas.

[42] Filariasis and bilharziasis (or schistosomiasis) are parasitic diseases caused by round worms living in the soil or in the surface waters.

[43] Health and Safety Executive: *Occupational health risks from cattle*, Agriculture Information Sheet No. 9 (United Kingdom, 1996).

[44] G. F. Gambini et al.: "Cancer mortality among rice growers in Novara Province, Northern Italy", in *American Journal of Industrial Medicine* (New York, 1997), No. 31.

[45] International Agency for Research on Cancer/World Health Organization: "Schistosomes, liver flukes and helicobacter pylori", in *IARC Monographs on the evaluation of carcinogenic risks to humans* (Lyon, France, 1996), Vol. 61.

[46] Forastieri: *Ergonomic problems in agriculture in developing countries*, op. cit.

[47] ibid.

[48] ibid.

[49] J. N. Djubgang: "Possible re-emergence of tuberculosis among agricultural workers in Cameroon", in *African Newsletter on Occupational Health and Safety* (Helsinki, 1994), No. 2.

[50] MSA, op. cit.

[51] IMF: *World Economic Outlook*, op. cit.

[52] Castillo Martinez and Wesseling: *Diagnóstico de la problemática de los plaguicidas* ..., op. cit.

[53] B. Dinham: "Organochlorines in African ecosystems", in *Pesticides News* (The Pesticides Trust, 1997), No. 36.

CHAPTER V

ILO ACTION ON SAFETY AND HEALTH IN AGRICULTURE

ILO INSTRUMENTS, GUIDES AND CODES OF PRACTICE

A number of ILO Conventions and Recommendations are either of direct concern to safety and health in agriculture or are relevant to agriculture and include provisions on occupational safety and health. These instruments, together with the number of ratifications, are listed in Annexes I and II.

Codes of practice and technical guides are intended to provide advice and stimulate action at both national and operational levels. The codes of practice and guides of direct concern to occupational safety and health in agriculture are:

- *Codes of practice* — Safe design and use of chain saws (1978); Safe construction and operation of tractors (1976); Safety and health in forestry work (1998);
- *Guides* — Guide to safety in agriculture (1969); Guide to health and hygiene in agricultural work (1979); Safety and health in the use of agrochemicals: A guide (1991).

Some of these publications issued in the 1960s and 1970s need to be revised in the light of recent trends.

MEETINGS

In 1962, the Joint ILO/WHO Committee on Occupational Health dealt, at its Fourth Session, with occupational health problems in agriculture[1] and defined agriculture as "all forms of activities connected with growing, harvesting and primary processing of all types of crops, with the breeding, raising and caring for animals, and with tending gardens and nurseries". The Committee further defined an agricultural worker as "any person engaged either permanently or temporarily, irrespective of his legal status, in activities related to agriculture as defined above". This Committee proposed for the first time the formulation of an ILO Convention concerning safety and health in agriculture.

Issues related to the conditions of employment and work of agricultural wage workers were discussed at a sectoral meeting organized by the ILO in Geneva in 1996. The resolutions adopted at that meeting emphasized the need for further studies, research and technical assistance in agriculture.[2] However, workers account for only a share of those in need of protection. The majority of wage workers are concentrated in Latin America; but in Asia, Africa and Europe most of agricultural workers are self-employed.

TECHNICAL COOPERATION

Based on the principles embodied in the provisions of the Occupational Safety and Health Convention, 1981 (No. 155), a model strategy for developing occupational

safety and health in agriculture was drawn up and tested within the framework of a technical cooperation project in the Central American region from September 1993 to July 1998. The project strategy was oriented towards the implementation of a national policy for the improvement of occupational safety and health in agriculture with the aim of preventing occupational accidents and diseases and protecting workers' health and the environment. The target beneficiaries of the project were rural workers and their families. The project's activities were carried out in cooperation with employers and wage workers, including temporary workers, in large and medium-sized enterprises, involving also small-scale farmers organized in cooperatives or members of rural trade unions. These activities were designed to help improve and strengthen national capacities for an integrated management approach dealing with safety and health in agriculture. The project had the following five main components:

1. The updating and consolidation of safety and health legislation to provide a better legislative framework for the agricultural sector.
2. The promotion of inter-institutional coordination, the development of national plans and the creation of national advisory committees on agriculture to follow up and coordinate the activities — in which all the relevant institutions and social partners within the sector would be involved.[3]
3. Awareness, information and training on occupational safety and health for rural employers and workers, inspection services, health care personnel and agricultural technicians. A network of trainers from each of the institutions and groups concerned was created during the project to follow up and coordinate the training activities. There was also a close involvement of the Ministries of Education and similar institutions in the development and application of training materials and methodologies. These methodologies were developed and adapted to deal specifically with safety and health problems in both large enterprises and small farms. The level of potential users, whether linguistic or literacy, was kept in mind. Information centres/databases on safety and health in agriculture were established at the local level and made available to the groups concerned. Each information centre had a focal point made up of staff who were trained in the use of the database. Special attention was paid to the participation of rural women in the project. Contacts were thus established with rural women's organizations and other ILO projects and a number of rural women were trained as trainers.
4. The establishment of preventive programmes at the local level dealing both with the surveillance of the working environment and workers' health. Attention was focused on the importance of safety and health committees and the joint inspection of workplaces — in large enterprises and in cooperatives and farmers' associations. Advice was also given on the selection of chemicals used in agriculture and machinery and tools, taking into account safety and ergonomic aspects.
5. The development of a sustainable approach to safety in the use and management of chemicals in agricultural work — in view of the fact that a high proportion of occupational hazards among agricultural workers in Central America are due to exposure to agrochemicals. This approach included, among others, the promotion and support of classification systems and elaboration of chemical safety data sheets for those chemicals most frequently used in the region. Advice on environmental impact assessment and agrochemical waste management was provided.

Training activities covered safety in the use of pesticides, alternative methods of pest control, integrated pest management, organic farming and other agro-ecological methods.

The experience gained through this project demonstrated the need for an integrated approach which should include occupational, public and environmental health, consistent with trends in agriculture at the national and international levels. Experience has shown that the model is sound and its replication in other countries and regions advisable; however, further applied research needs to be undertaken to have a broader international perspective. Work during the current biennium will pay special attention to agriculture as a particularly hazardous sector providing technical assistance to member States in the framework of the ILO's proposed Global Programme on Occupational Safety, Health and the Environment.[4]

Cooperation with other international organizations

At its Eleventh Session in April 1992, the Joint ILO/WHO Committee on Occupational Health recommended a joint programme for the improvement of the health of workers in agriculture.[5] This is a field in which cooperation between the ILO and WHO is carried out through technical cooperation activities. In particular, the ILO has collaborated in Central American countries with the Pan-American Health Organization (PAHO) Programme on "Environment and Health in the Central American Isthmus", with a view to achieving a better impact through combined efforts. A number of successful joint activities have been carried out in the areas of environment and health.

Towards the adoption of new standards

There is worldwide recognition that agriculture is a particularly hazardous sector — alongside mining and construction — in both developing and industrialized countries. International standards and updated codes of practice already exist in the mining and construction sectors. Although agricultural wage workers are covered by the Plantations Convention, 1958 (No. 110), and agriculture is also generally covered by the ILO's framework Occupational Safety and Health Convention, 1981 (No. 155), which applies to all branches of economic activity, there is no comprehensive Convention dealing with the safety and health problems of workers in agriculture. In this context, there is a need for a more holistic approach to occupational safety and health standards. Occupational safety and health in agriculture needs to be addressed within a well-defined strategy and must be integrated into a rural development policy involving both commercial undertakings (plantations) and small-scale farming.

As discussed in Chapters II and III, protective legislation should be extended to agricultural workers to improve their working conditions and welfare. A Convention containing basic principles of safety and health in agriculture, supplemented by a Recommendation, would provide a sound basis upon which subsequent national legislation could be built. These standards could be usefully complemented in the future by the preparation of a code of practice.

Notes

[1] ILO: *Occupational health problems in agriculture*, 1963, op. cit., p. 4.

[2] ILO: *Note on the Proceedings*, Tripartite Meeting on improving the conditions of employment and work of agricultural wage workers in the context of economic restructuring, Geneva, 23-27 September 1996.

[3] Such as: Ministries of Labour, Agriculture, Health and Environment, social security institutions, trade unions, employers' organizations and relevant rural non-governmental organizations.

[4] ILO: *Programme and Budget for 1998-99* (Geneva, 1997), para. 90.2.

[5] See point 11 of the Consensus Statement of the Joint ILO/WHO Committee on Occupational Health, Eleventh Session, Geneva, April 1992 (see doc. GB.254/10/3/1).

QUESTIONNAIRE

At its 271st Session in March 1998, the Governing Body requested the Office to place an item on safety and health in agriculture on the agenda of the 88th Session (2000) of the International Labour Conference.

It was decided that there was a compelling case to develop standards in this area in order to meet the challenge of improving the safety and health of agricultural workers. This decision was based on the recognition that farming was one of the most dangerous occupations, alongside mining and construction, for which sectoral standards already existed. Agriculture was considered of universal relevance and particularly important for developing countries.

The purpose of the questionnaire is to request member States for their views on the scope and content of the proposed instrument or instruments, after consultation with the most representative organizations of employers and workers. Due to the broad scope of the sector, it would be advisable to consult other relevant Ministries and institutions dealing with agriculture, such as Ministries of Agriculture, Health and Environment, for the preparation of the replies.

In drafting the questionnaire, account was taken of the suggestions made by the Director-General in the Annex to his report, *The ILO, standard setting and globalization*, submitted to the 85th Session of the Conference in 1997. The presentation of the questionnaire is therefore somewhat open, so that member States might, it is hoped, submit more precise guidelines than in the past; we believe that this would be more in line with the needs of the ILO constituents.

Form of the international instrument

1. Do you consider that the International Labour Conference should adopt an instrument or instruments concerning safety and health in agriculture?

2. If yes, should the general intention be to ensure that all workers in agriculture enjoy safety and health protection that is, as far as possible, equivalent to that provided to workers in the other sectors of the economy?

3. Do you consider the instrument or instruments should take the form of:

(a) a Convention?

(b) a Recommendation? or

(c) a Convention supplemented by a Recommendation?

If you chose subparagraph (c), you may, in your comments on the questions set out below, indicate which elements of the question concerned should be dealt with by a Convention or by a Recommendation.

Preamble

4. Should the instrument(s) include a preamble referring to:

(a) Conventions and Recommendations containing provisions of direct relevance to safety and health?[1]

If yes, which of them should be included?

(b) Other Conventions and Recommendations relevant to agriculture? [2]

If yes, which of them should be included?

(c) The Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy, adopted by the Governing Body of the International Labour Office?

I. Definitions and scope

5. Should, for the purposes of the instrument(s), the term "agriculture" (or "agricultural")[3] *cover:*

(a) all activities (whether indoor or outdoor) related to cultivating, growing, harvesting and primary processing of agricultural products?

(b) livestock breeding and production of animal husbandry products?

(c) fish farming?

(d) any process, operation or transportation which occurs in an agricultural workplace?

(e) the services related to agricultural production?

6. Should the proposed instrument(s) cover:

(a) all agricultural undertakings, irrespective of size?

(b) collective economic enterprises, such as cooperatives and farmers' associations?

(c) machinery, equipment, appliances, tools, and installations used in conjunction with agricultural activities?

7. Should the definition of "agriculture" exclude:

(a) industrial processes that use agricultural products as raw material?

(b) the forestry industry or any work performed in a forest related to cultivating, conserving or exploiting forests?

(c) transportation of agricultural products outside the workplace?

8. Should the proposed instrument(s) cover all workers in agriculture including the self-employed?

9. Should the proposed instrument(s) provide that the competent authority of a Member State, after consulting the most representative organizations of employers and workers concerned:

(a) may exclude from the scope of application of the instrument(s) any other process or category of workers; and if so by reference to what criteria?

(b) should, in the case of exclusion of certain agricultural processes or categories of workers, make plans for progressively covering all processes and categories of workers in agriculture?

II. General principles

10. (a) Should the instrument(s) provide that Members should adopt a national policy with the aim of preventing accidents and diseases in agriculture?

(b) Should the policy require those responsible for implementing it to:

(i) establish priorities for action, identify major problems, develop effective methods for dealing with them and evaluate results?

(ii) take into consideration technological progress and knowledge in the field of safety and health in agriculture, including relevant standards, guidelines and codes of practice adopted by recognized international organizations and changes in international regulations?

(c) Should the policy provide for a system for the surveillance of the health of workers in agriculture and their working environment covering at least the following:

(i) hazardous chemicals;

(ii) toxic, infectious or allergenic biological agents;

(iii) carcinogenic substances or agents;

(iv) noise and vibration;

(v) ergonomic hazards and injuries;

(vi) extreme temperatures;

(vii) solar ultraviolet radiations;

(viii) transmissible animal diseases;[4]

(ix) contact with wild and poisonous animals;

(x) special health surveillance measures for young workers and pregnant women?

11. Should the instrument(s) provide that national laws and regulations:

(a) designate the competent authority or authorities responsible for the implementation and enforcement of national laws and regulations on occupational safety and health in agriculture?

(b) indicate, where there is more that one competent authority, their respective functions and responsibilities, taking into account both the complementary character of such responsibilities within the sector and national conditions and practice?

(c) provide for arrangements appropriate to national conditions and practice to ensure adequate inter-sectoral coordination between various authorities and bodies in order to ensure that the policy and the measures for its application are consistent?

(d) specify the rights and duties of employers and workers with respect to safety and health in agriculture?

(e) provide for appropriate penalties and corrective measures, including the suspension or restriction of agricultural activities on safety and health grounds, until the conditions giving rise to the suspension or restriction have been corrected?

(f) establish procedures for the recording and notification of occupational accidents and diseases in agriculture?

(g) prescribe measures for the prevention and control of occupational hazards in agriculture, taking into account the protection of the general environment?

(h) make provisions for the progressive development of occupational health services, that are adequate and appropriate to the specific risks of agricultural enterprises and define their functions and conditions of operation?

(i) specify the steps to be taken in order to eradicate or control prevalent endemic diseases, in areas where such exist?

12. Should attention be given to the special situation of certain categories of workers such as:

(a) temporary and seasonal workers?

(b) members of the family of the operator of the undertaking?

(c) migrant workers?

(d) tenants and sharecroppers?

(e) small owner-occupiers in subsistence farming?

(f) landless workers in agriculture in the rural informal sector?

(g) other workers in agriculture?

III. Inspection

13. Should the instrument(s) provide that Members should ensure that an adequate and appropriate inspection service for agricultural workplaces is in place and is provided with adequate means?

14. How might labour inspection in agriculture be carried out? Please indicate your preferences for one or more of the following examples:

(a) a single labour inspection service responsible for all sectors of economic activity?

(b) a single labour inspection service, which would arrange for internal specialization either through:

(i) the appropriate training of inspectors in agriculture?

(ii) a unit technically qualified in agriculture?

(c) a labour inspection service specialized in agriculture, reporting to a central body responsible for coordinating labour inspection?

(d) a labour inspection service assisted for certain inspection functions at the regional or local levels by appropriate government services or public institutions?

(e) any other method established by the competent authority in accordance with national law and practice? Please specify.

15. Should the instrument(s) provide that the competent authority should promote:

(a) an advisory role for the inspection services, and

(b) effective cooperation between the inspection services in agriculture and other relevant services or institutions?

IV. Preventive and protective measures

GENERAL

16. Should the instrument(s) provide that, whenever two or more employers engage in activities in the same agricultural workplace, each employer should be responsible for the health and safety of their workers and that they should cooperate in applying the requirements of the instrument(s)?

17. (a) Should the instrument(s) provide that the employer(s) take appropriate preventive, protective and control measures to ensure that all agricultural activities, workplaces, machinery, equipment, tools and processes under their control are safe and without risk to the health of workers?

(b) Should the instrument(s) specify the way in which employer(s) should assess and deal with the risks in taking preventive, protective and control measures?[5]

18. Should the instrument(s) provide that, to this end and on the basis of the general principles of occupational safety and health, the employer(s) should:

(a) establish a policy on safety and health in agriculture at the enterprise level?

(b) establish a safety and health management system and an occupational health surveillance programme to implement the policy?

(c) periodically review the effectiveness and efficiency of the measures taken?

(d) establish and maintain a system of record-keeping and notification of accidents and diseases at the enterprise level?

(e) ensure the provision of occupational health services which are adequate and appropriate to the specific risks in agriculture?

(f) take measures to ensure that workers in agriculture are provided with the necessary pre-assignment and periodical medical examinations and tests to evaluate the exposure of workers and monitor their health?

(g) provide information to workers, in a comprehensible manner, on the hazards associated with their work, the health risks involved and relevant preventive and protective measures?

(h) provide for safety measures to deal with accidents and emergencies?

(i) provide workers who have suffered an injury or illness at the workplace with first aid, appropriate transportation and access to appropriate medical facilities?

19. Should the instrument(s) provide that all appropriate precautions be taken by the employer(s) to protect the public and the environment from all risks which may arise from the agricultural activity concerned?

CHEMICAL SAFETY

20. Should the instrument(s) provide that the competent authority should take measures, in accordance with national law and practice, to ensure that:

(a) those who produce, import, provide or transfer chemicals or biological products for use in agriculture follow internationally agreed standards on safety and health, and provide adequate and appropriate information to the competent authority and the users?

(b) there is an appropriate national system with specific criteria with respect to the importation, classification, labelling and banning or restriction of chemicals used in agriculture?

21. Should the instrument(s) specify that the preventive, protective and control measures to be taken by employer(s) with respect to the use of chemicals in agriculture should in particular cover:

(a) the preparation, handling, storage and transportation of chemicals;

(b) the disposal of empty containers and the treatment and disposal of chemical wastes;

(c) the release of chemicals resulting from agricultural activities; and

(d) the maintenance, repair and cleaning of equipment and containers for chemicals?

22. Should the instrument(s) provide that, at the enterprise level, employer(s):

(a) establish a system for the classification and labelling of chemicals used in agriculture and ensure that all containers are appropriately labelled?

(b) establish criteria and procedures for the treatment and disposal of hazardous wastes and empty containers of chemicals, consistent with national and international regulations, to protect the safety of workers, the public and the environment?

(c) ensure that the use, storage and transportation of chemicals at the workplace is carried out by trained competent and authorized persons?

MACHINERY SAFETY AND ERGONOMICS

23. Should the instrument(s) specify that the preventive, protective and control measures to be taken by employers in agricultural undertakings in tropical and subtropical countries be adapted to the conditions in those countries and, in particular, in matters relating to climate, transfer of technology, work processes and working practices?

24. (a) Should the instrument(s) provide that national laws and regulations should prescribe that agricultural machinery, equipment and appliances comply with safety and health standards?

(b) If yes, should the instrument(s) provide that the competent authority should take measures to ensure that manufacturers and suppliers of machinery, equipment, and appliances used in agriculture, comply with safety and health standards and provide adequate and appropriate information?

(c) Should the instrument(s) also specify minimum requirements at the enterprise level in areas such as: selection, guarding and maintenance of machinery and equipment?

25. Should the instrument(s) provide that:

(a) dangerous machinery such as tractors and harvesters should be operated only by trained, competent and authorized persons?

(b) no person should be transported with agricultural machinery not designed for human transportation?

26. Should the instrument(s) specify that the employer(s) should organize the work in such a way as to provide workers with regular rest breaks or alternation of tasks in order to reduce workload and fatigue?

27. (a) Should the instrument(s) provide that the competent authority, after consulting the most representative organizations of employers and workers concerned, establish safety and health requirements concerning the manual transportation of loads?

(b) If yes, should the instrument(s):

(i) cover the principle that no agricultural worker shall be required or permitted to transport manually a load which is a risk to health or safety?

(ii) also specify minimum safety and health requirements in such areas as transportation techniques, mechanical and technical devices, training and protective equipment?

CONSTRUCTION WORK ON FARMS

28. Should the instrument(s) provide that the employer(s) should ensure compliance with national laws and safety standards when constructing, maintaining or repairing buildings, installations, rails or fences?

SILOS, PITS, CELLARS AND TANKS

29. (a) Should the instrument(s) provide that national laws and regulations should prescribe safety and health requirements for the various confined spaces relevant to agriculture such as silos, pits, cellars, tanks and similar structures?

(b) If yes, should the instrument(s) specify minimum safety and health requirements concerning those confined spaces?

ANIMAL HANDLING

30. (a) Should the instrument(s) provide that national laws and regulations should prescribe safety and health requirements concerning animal handling activities?

(b) If yes, should the instrument(s) specify minimum safety and health requirements in such areas as veterinary control, immunization, protective clothing and equipment, contact with poisonous animals?

WELFARE AND ACCOMMODATION FACILITIES

31. (a) Should the instrument(s) provide that where the employer(s) make available to workers in agriculture accommodation and welfare facilities, the latter should conform with safety and health standards?

(b) If yes, should the instrument(s) specify the minimum safety and health requirements?

(c) Should the instrument(s) also provide that the facilities should be made available by the employers to workers in agriculture at no cost to them?

INSURANCE AGAINST OCCUPATIONAL INJURIES AND SICKNESS

32. Should the instrument(s) provide that workers in agriculture be covered by a scheme of compulsory insurance against occupational injuries and sickness, invalidity and other similar risks providing a protection that is at least equivalent to that enjoyed by workers in industrial undertakings?

33. Should the instrument(s) provide that where economic, social and administrative conditions permit, a special insurance scheme should be established for self-employed workers including persons of small means working on their own account in agriculture?[26]

INFORMATION AND TRAINING

34. Should the instrument(s) provide that employer(s) should ensure that:

(a) adequate and appropriate training and comprehensible instructions on safety and health and on the work assigned are provided to workers in agriculture and their representatives, at no cost to them?

(b) all safety instructions and any necessary guidance are understandable to all workers and, in particular, to the newly engaged or inexperienced workers assigned to a task?

(c) records of hazardous chemicals used in agriculture and chemical safety data sheets are accessible to all workers concerned and their representatives?

V. Rights and duties of workers

35. Should the instrument(s) provide that workers in agriculture and their representatives have the duty to cooperate and comply with the prescribed safety and health measures to permit compliance with the duties and responsibilities placed on the employer(s) by national laws and regulations?

36. Should the instrument(s) provide that workers in agriculture have the right to be informed and consulted on safety and health matters, refuse hazardous work, collectively select safety and health representatives and participate in workplace inspections?

SELF-EMPLOYED WORKERS

37. Should the instrument(s) provide that self-employed workers be required to comply with prescribed safety and health measures and take reasonable care of their own safety and health and that of other persons?

38. (a) Should the instrument(s) provide that the competent authority should progressively extend the coverage of inspection services in agriculture to provide assis-

tance and appropriate advice to self-employed workers on the health and safety measures to be taken to protect themselves and those working with them?

(b) If yes, should the instrument(s) specify the type of assistance and advice that should be provided?

VI. Special problems

39. Are there unique features of national law or practice which, in your view, are liable to create difficulties in the practical application of the proposed instrument(s) as conceived in this questionnaire?

40. **For Federal States only:** *Do you consider that, in the event of the instrument(s) being adopted, the subject-matter would be appropriate for federal action, or wholly or in part for the action by the constituent units of the federation?*

41. Are there in your view, any other pertinent problems not covered by the present questionnaire which ought to be taken into consideration when the instrument(s) are being drafted?

Notes

[1] See Annex I.

[2] See Annex II.

[3] See the ILO definition of agriculture in Chapter II.

[4] According to national law and practice.

[5] See Chapter III.

[6] See Recommendation No. 121.

ANNEX I

ILO Conventions and Recommendations of direct relevance to safety and health in agriculture adopted since 1919

1. Plantations Convention, 1958 (No. 110), and its accompanying Recommendation (No. 110).
2. Guarding of Machinery Convention, 1963 (No. 119), and its accompanying Recommendation (No. 118).
3. Employment Injury Benefits Convention, 1964 (No. 121), and its accompanying Recommendation (No. 121) [Schedule I amended in 1980].
4. Maximum Weight Convention, 1967 (No. 127), and its accompanying Recommendation (No. 128).
5. Labour Inspection (Agriculture) Convention, 1969 (No. 129), and its accompanying Recommendation (No. 133).
6. Minimum Age Convention, 1973 (No. 138), and its accompanying Recommendation (No. 146).
7. Occupational Cancer Convention, 1974 (No. 139), and its accompanying Recommendation (No. 147).
8. Working Environment (Air Pollution, Noise and Vibration) Convention, 1977 (No. 148), and its accompanying Recommendation (No. 156).
9. Occupational Safety and Health Convention, 1981 (No. 155), and its accompanying Recommendation (No. 164).
10. Occupational Health Services Convention, 1985 (No. 161), and its accompanying Recommendation (No. 171).
11. Safety in Construction Convention, 1988 (No. 167), and its accompanying Recommendation (No. 175).
12. Chemicals Convention, 1990 (No. 170), and its accompanying Recommendation (No. 177).

Ratifications of ILO Conventions of direct relevance to safety and health in agriculture

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.110 Plantations Convention, 1958 [and Protocol, 1982]	Côte d'Ivoire; Cuba; Ecuador; Guatemala; Mexico; Nicaragua; Panama; Philippines; Sri Lanka; Uruguay.	**10**
C.119 Guarding of Machinery Convention, 1963	Algeria; Azerbaijan; Belarus; Bosnia and Herzegovina; Brazil; Central African Republic; Congo; Croatia; Cyprus; Democratic Rep. of the Congo; Denmark; Dominican Rep.; Ecuador; Finland; Ghana; Guatemala; Guinea; Iraq; Italy; Japan; Jordan; Kuwait; Kyrgyzstan; Latvia; Madagascar; Malaysia; Malta; Morocco; Nicaragua; Niger; Norway; Panama; Paraguay; Poland; Russian Fed.; San Marino; Sierra Leone; Slovenia; Spain; Sweden; Switzerland; Syrian Arab Rep.; Tajikistan; The Former Yugoslav Rep. of Macedonia; Tunisia; Turkey; Ukraine; Uruguay; Yugoslavia.	**49**
C.121 Employment Injury Benefits Convention, 1964 [Schedule I amended in 1980]	Belgium; Bolivia; Bosnia and Herzegovina; Croatia; Cyprus; Democratic Rep. of the Congo; Ecuador; Finland; Germany; Guinea; Ireland; Japan; Libyan Arab Jamahiriya; Luxembourg; Netherlands; Senegal; Slovenia; Sweden; The Former Yugoslav Rep. of Macedonia; Uruguay; Venezuela; Yugoslavia.	**22**
C.127 Maximum Weight Convention, 1967	Algeria; Brazil; Bulgaria; Chile; Costa Rica; Ecuador; France; Guatemala; Hungary; Italy; Lebanon; Lithuania; Madagascar; Malta; Moldova, Rep. of; Nicaragua; Panama; Poland; Portugal; Romania; Spain; Thailand; Tunisia; Turkey; Venezuela.	**25**

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.129 Labour Inspection (Agriculture) Convention, 1969	Argentina; Belgium; Bolivia; Bosnia and Herzegovina; Burkina Faso; Colombia; Costa Rica; Côte d'Ivoire; Croatia; Denmark; El Salvador; Finland; France; Germany; Guatemala; Guyana; Hungary; Italy; Kenya; Latvia; Madagascar; Malawi; Malta; Moldova, Rep. of; Morocco; Netherlands; Norway; Poland; Portugal; Romania; Slovenia; Spain; Sweden; Syrian Arab Rep.; The Former Yugoslav Rep. of Macedonia; Uruguay; Yugoslavia; Zimbabwe.	**38**
C.138 Minimum Age Convention, 1973	Albania; Algeria; Antigua and Barbuda; Argentina; Azerbaijan; Belarus; Belgium; Bolivia; Bosnia and Herzegovina; Botswana; Bulgaria; Costa Rica; Croatia; Cuba; Cyprus; Denmark; Dominica; El Salvador; Equatorial Guinea; Finland; France; Georgia; Germany; Greece; Guatemala; Guyana; Honduras; Iraq; Ireland; Israel; Italy; Jordan; Kenya; Kyrgyzstan; Libyan Arab Jamhiriya; Luxembourg; Malaysia; Malta; Mauritius; Nepal; Netherlands; Nicaragua; Niger; Norway; Philippines; Poland; Romania; Russian Fed.; Rwanda; San Marino; Slovakia; Slovenia; Spain; Sweden; Tajikistan; The Former Yugoslav Rep. of Macedonia; Togo; Tunisia; Ukraine; Uruguay; Venezuela; Yugoslavia; Zambia.	**63**
C.139 Occupational Cancer Convention, 1974	Afghanistan; Argentina; Belgium; Bosnia and Herzegovina; Brazil; Croatia; Czech Rep.; Denmark; Ecuador; Egypt; Finland; France; Germany; Guinea; Guyana; Hungary; Iceland; Iraq; Ireland; Italy; Japan; Nicaragua; Norway; Peru; Slovakia; Slovenia; Sweden; Switzerland; Syrian Arab Rep.; The Former Yugoslav Rep. of Macedonia; Uruguay; Venezuela; Yugoslavia.	**33**

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.148 Working Environment (Air Pollution, Noise & Vibration) Convention, 1977	Azerbaijan; Belgium; Bosnia and Herzegovina; Brazil; Costa Rica; Croatia; Cuba; Czech Rep.; Denmark; Ecuador; Egypt; Finland; France; Germany; Ghana; Guatemala; Guinea; Hungary; Iraq; Italy; Kazakstan; Kyrgyzstan; Latvia; Malta; Niger; Norway; Portugal; Russian Fed.; San Marino; Slovakia; Slovenia; Spain; Sweden; Tajikistan; Tanzania, United Rep. of; The Former Yugoslav Rep. of Macedonia; United Kingdom; Uruguay; Yugoslavia; Zambia.	**40**
C.155 Occupational Health and Safety Convention, 1981	Bosnia and Herzegovina; Brazil; Croatia; Cuba; Cyprus; Czech Rep.; Denmark; Ethiopia; Finland; Hungary; Iceland; Ireland; Kazakstan; Latvia; Mexico; Mongolia; Netherlands; Nigeria; Norway; Portugal; Slovakia; Slovenia; Spain; Sweden; The Former Yugoslav Rep. of Macedonia; Uruguay; Venezuela; Viet Nam; Yugoslavia.	**29**
C.161 Occupational Health Services Convention, 1985	Bosnia and Herzegovina; Brazil; Burkina Faso; Croatia; Czech Rep.; Finland; Germany; Guatemala; Hungary; Mexico; San Marino; Slovakia; Slovenia; Sweden; The Former Yugoslav Rep. of Macedonia; Uruguay; Yugoslavia.	**17**
C.167 Safety and Health in Construction Convention, 1988	Colombia; Czech Rep.; Denmark; Dominican Rep.; Finland; Germany; Guatemala; Hungary; Iraq; Lesotho; Mexico; Norway; Slovakia; Sweden.	**14**
C.170 Chemicals Convention, 1990	Brazil; Burkina Faso; China; Colombia; Mexico; Norway; Sweden.	**7**

ANNEX II

Other existing ILO Conventions and Recommendations relevant to agriculture adopted since 1919

1. Right of Association (Agriculture) Convention, 1921 (No. 11).
2. Workmen's Compensation (Agriculture) Convention, 1921[1] (No. 12).
3. Unemployment (Agriculture) Recommendation, 1921 (No. 11).
4. Living-in conditions (Agriculture) Recommendation, 1921 (No. 16).
5. Social Insurance (Agriculture) Recommendation, 1921 (No. 17).
6. Migration for Employment Convention (Revised), 1949 (No. 97), and its accompanying Recommendation (Revised) (No. 86).
7. Minimum Wage Fixing Machinery (Agriculture) Convention, 1951 (No. 99), and its accompanying Recommendation (No. 89).
8. Holidays with Pay (Agriculture) Convention, 1952 (No. 101), and its accompanying Recommendation (No. 93).

[1] Most of its provisions are incorporated in C.110.

Ratifications of other existing ILO Conventions relevant to agriculture adopted since 1919

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.11 Right of Association (Agriculture) Convention, 1921	Albania; Algeria; Antigua and Barbuda; Argentina; Australia; Austria; Azerbaijan; Bahamas; Bangladesh; Barbados; Belarus; Belgium; Belize; Benin; Bosnia and Herzegovina; Brazil; Bulgaria; Burkina Faso; Burundi; Cameroon; Central African Rep.; Chad; Chile; China; Colombia; Comoros; Congo; Costa Rica; Côte d'Ivoire; Croatia; Cuba; Cyprus; Czech Rep.; Democratic Rep. of the Congo; Denmark; Djibouti; Dominica; Ecuador; Egypt; Estonia; Ethiopia; Fiji; Finland; France; Gabon; Germany; Ghana; Greece; Grenada; Guatemala; Guinea; Guyana; Iceland; India; Iraq; Ireland; Italy; Jamaica; Kenya; Kyrgyzstan; Latvia; Lesotho; Lithuania; Luxembourg; Madagascar; Malawi; Malaysia; Mali; Malta; Mauritania; Mauritius; Mexico; Morocco; Mozambique; Myanmar; Netherlands; New Zealand; Nicaragua; Niger; Nigeria; Norway; Pakistan; Panama; Papua New Guinea; Paraguay; Peru; Poland; Portugal; Romania; Russian Fed.; Rwanda; Saint Lucia; Senegal; Seychelles; Singapore; Slovakia; Slovenia; Solomon Islands; Spain; Sri Lanka; Suriname; Swaziland; Switzerland; Sweden; Syrian Arab Rep.; Tajikistan; Tanzania, United Rep. of; The Former Yugoslav Rep. of Macedonia; Togo; Tunisia; Turkey; Uganda; Ukraine; United Kingdom; Uruguay; Venezuela; Yugoslavia; Zambia.	**118**

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.12 Workmen's Compensation (Agriculture) Convention, 1921	Angola; Antigua and Barbuda; Argentina; Australia; Austria; Bahamas; Barbados; Belgium; Belize; Bosnia and Herzegovina; Brazil; Bulgaria; Burundi; Chile; Colombia; Comoros; Croatia; Cuba; Czech Rep.; Democratic Rep. of the Congo; Denmark; Djibouti; Dominica; El Salvador; Estonia; Fiji; Finland; France; Gabon; Germany; Grenada; Guinea-Bissau; Guyana; Haiti; Hungary; Ireland; Italy; Kenya; Latvia; Luxembourg; Madagascar; Malawi; Malaysia; Malta; Mauritius; Mexico; Morocco; Netherlands; New Zealand; Nicaragua; Norway; Panama; Papua New Guinea; Peru; Poland; Portugal; Rwanda; Saint Lucia; Senegal; Singapore; Slovakia; Slovenia; Solomon Islands; Spain; Swaziland; Sweden; Tanzania, United Rep. of; The Former Yugoslav Rep. of Macedonia; Tunisia; Uganda; United Kingdom; Yugoslavia; Zambia.	**73**
C.97 Migration for Employment Convention (Revised), 1949	Algeria; Bahamas; Barbados; Belgium; Belize; Bosnia and Herzegovina; Brazil; Burkina Faso; Cameroon; Cuba; Cyprus; Dominica; Ecuador; France; Germany; Grenada; Guatemala; Guyana; Israel; Italy; Jamaica; Kenya; Malawi; Malaysia; Mauritius; Netherlands; New Zealand; Nigeria; Norway; Portugal; Saint Lucia; Slovenia; Spain; Tanzania (Zanzibar); The Former Yugoslav Rep. of Macedonia; Trinidad and Tobago; United Kingdom; Uruguay; Venezuela; Yugoslavia; Zambia.	**41**

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.99 Minimum Wage Fixing Machinery (Agriculture) Convention, 1951	Algeria; Australia; Austria; Belgium; Belize; Brazil; Cameroon; Central African Rep; Colombia; Comoros; Costa Rica; Côte d'Ivoire; Cuba; Czech Rep.; Djibouti; El Salvador; France; Gabon; Germany; Grenada; Guatemala; Guinea; Hungary; Ireland; Italy; Kenya; Malawi; Malta; Mauritius; Mexico; Morocco; Netherlands; New Zealand; Papua New Guinea; Paraguay; Peru; Philippines; Poland; Senegal; Seychelles; Sierra Leone; Slovakia; Spain; Sri Lanka; Swaziland; Syrian Arab Rep.; Tunisia; Turkey; Uruguay; Zambia; Zimbabwe.	**51**
C.101 Holidays with Pay (Agriculture) Convention, 1952	Algeria; Antigua and Barbuda; Austria; Barbados; Belgium; Belize; Brazil; Burundi; Central African Rep.; Colombia; Comoros; Costa Rica; Cuba; Djibouti; Ecuador; Egypt; France; Gabon; Guatemala; Hungary; Israel; Mauritania; Morocco; Netherlands; New Zealand; Paraguay; Peru; Poland; Saint Lucia; Senegal; Sierra Leone; Spain; Suriname; Swaziland; Syrian Arab Rep.; Tanzania (Tanganyika).	**36**
C.103 Maternity Protection Convention (Revised), 1952	Austria; Azerbaijan; Belarus; Bolivia; Bosnia and Herzegovina; Brazil; Chile; Croatia; Cuba; Ecuador; Equatorial Guinea; Ghana; Greece; Guatemala; Hungary; Italy; Kyrgyzstan; Libyan Arab Jamahiriva; Luxembourg; Moldova, Rep. of; Mongolia; Netherlands; Poland; Portugal; Russian Fed.; Slovenia; Spain; Sri Lanka; Tajikistan; The Former Yugoslav Rep. of Macedonia; Ukraine; Uruguay; Uzbekistan; Yugoslavia; Zambia.	**35**

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.140 Medical Care and Sickness Benefits Convention, 1969	Bolivia; Costa Rica; Czech Rep.; Denmark; Ecuador; Finland; Germany; Libyan Arab Jamahiriya; Luxembourg; Norway; Slovakia; Sweden; Uruguay; Venezuela.	**14**
C.141 Rural Workers' Organisations Convention, 1975	Afghanistan; Austria; Brazil; Burkina Faso; Costa Rica; Cuba; Cyprus; Denmark; Ecuador; El Salvador; Finland; France; Germany; Greece; Guatemala; Guyana; Hungary; India; Israel; Italy; Kenya; Mali; Malta; Mexico; Netherlands; Nicaragua; Norway; Philippines; Poland; Spain; Sweden; Switzerland; United Kingdom; Uruguay; Venezuela; Zambia.	**36**
C.142 Human Resources Development Convention, 1975	Afghanistan; Algeria; Argentina; Australia; Austria; Azerbaijan; Belarus; Bosnia and Herzegovina; Brazil; Cuba; Cyprus; Czech. Rep.; Denmark; Ecuador; Egypt; El Salvador; Finland; France; Georgia; Germany; Greece; Guinea; Guyana; Hungary; Iraq; Ireland; Israel; Italy; Japan; Jordan; Kenya; Korea, Rep. of; Kyrgyzstan; Latvia; Lithuania; Mexico; Netherlands; Nicaragua; Niger; Norway; Poland; Portugal; Russian Fed.; San Marino; Slovakia; Slovenia; Spain; Sweden; Switzerland; Tajikistan; Tanzania, United Rep. of; The Former Yugoslav Rep. of Macedonia; Tunisia; Turkey; Ukraine; United Kingdom; Venezuela; Yugoslavia.	**58**
C.160 Labour Statistics Convention, 1985	Australia; Austria; Azerbaijan; Belarus; Bolivia; Brazil; Canada; Colombia; Cyprus; Czech Rep.; Denmark; El Salvador; Finland; Germany; Greece; Guatemala; India; Ireland; Italy; Korea, Rep. of; Kyrgyzstan; Latvia; Mauritius; Mexico; Morocco; Netherlands; Norway; Panama; Poland; Portugal; Russian Fed.; San Marino; Slovakia; Spain; Sri Lanka; Swaziland; Sweden; Switzerland; Tajikistan; Ukraine; United Kingdom; United States.	**42**

Convention	Countries that have ratified the Convention (by June 1998)	Number of ratifications
C.169 Indigenous and Tribal Peoples Convention, 1989	Bolivia; Colombia; Costa Rica; Denmark; Guatemala; Honduras; Mexico; Netherlands; Paraguay; Peru.	**10**

Price: 15.00 Swiss francs

ISBN 92-2-111517-8

INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

CH-1211 GENEVE 22

P. P.
1211 GENEVE 22